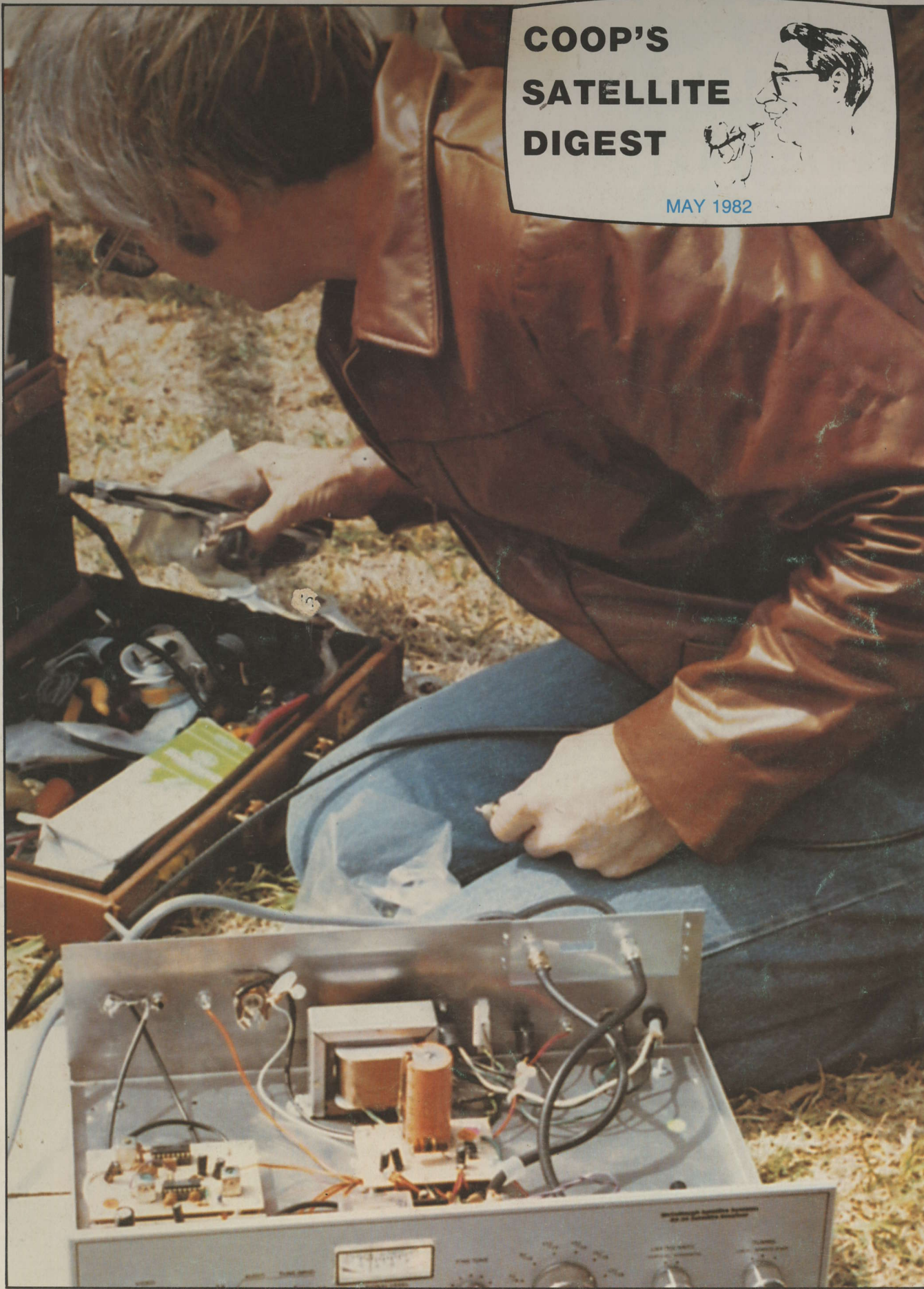


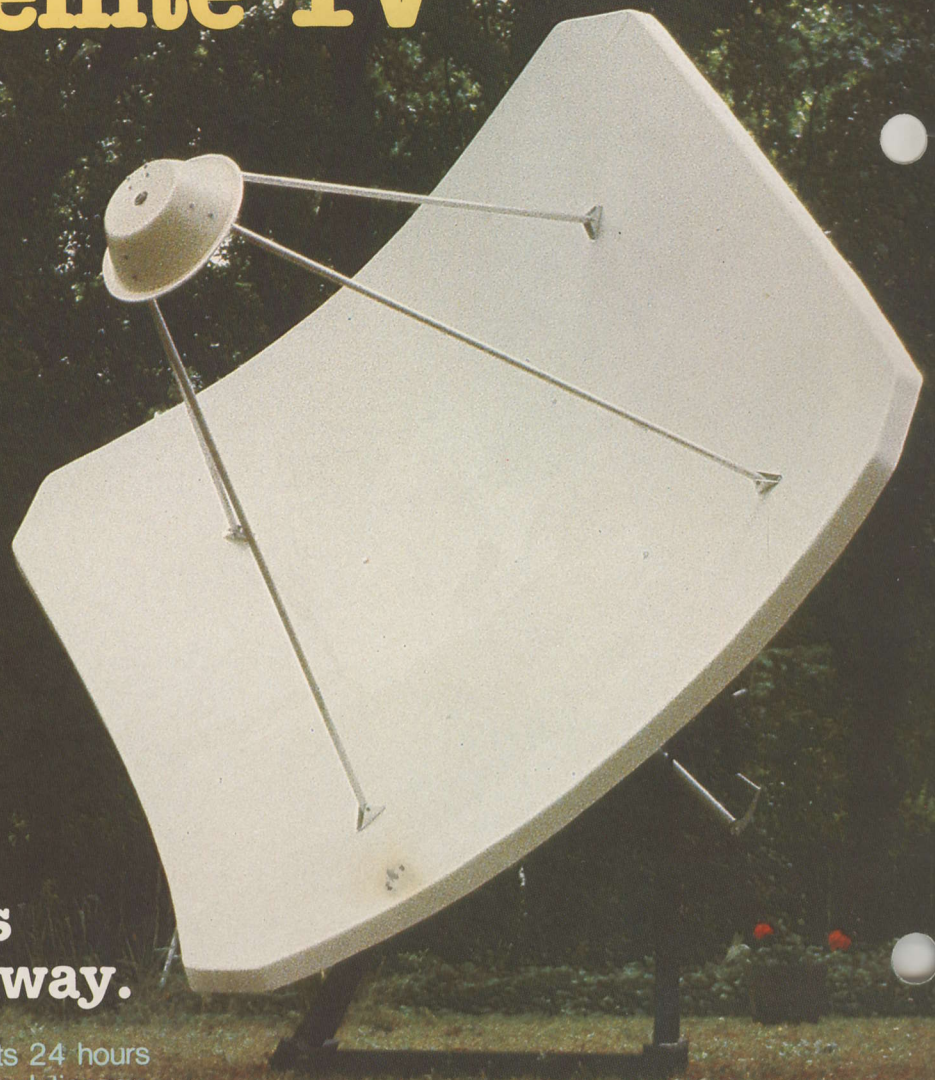
**COOP'S
SATELLITE
DIGEST**



MAY 1982



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TOP OF THE MONTH

WESTERN UNION is apparently feeling pressure from somebody; possibly the Westinghouse folks. They rushed the W1 to W4 transfer, and advanced the W4 turn-on date to April 1st. They missed that one (April Fool!) but did make it at 4AM (ET) on April 5th. The new 24 transponder W4 bird is looking good, but like F3R, it is no 'super bird.' We highlight what has been observed through mid-April, here, this month.

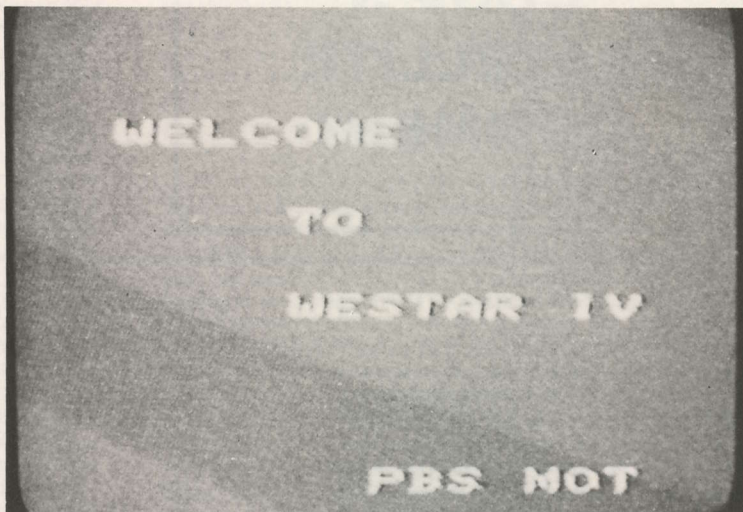
THEN, to keep the pressure up, WU requested permission to advance their W5 launch date from late summer to June. W5 will replace W2 at 123 west; and much of the temporary cable programming on W4 now may head for W5, as early as the end of July.

FORT WORTH may have been a watershed; for satellite shows. There are subtle, and not-so-subtle, pressures developing within the industry to change the way shows or seminars happen, and, are run. There is controversy here that impacts on all of us. We look at what happened in Fort Worth, and what may happen in the future, in this issue.

EQUIPMENT pricing plummeted in Fort Worth. Coop talks about what it may mean in Coop's Comment, here.

MAY 1982

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COOP'S SATELLITE DIGEST



COOP'S SATELLITE DIGEST published monthly by West Indies Video, Ltd; a Turks & Caicos Corporation with corporate offices located at Grace Bay, Providenciales, Turks & Caicos Islands (West Indies). U.S. offices are maintained at Ft. Lauderdale, Florida. All mail including subscriptions, advertising inquiries, reports and letters should be addressed to CSD, P.O. Box 100858, Ft. Lauderdale, FL 33310. CSD office hours in Ft. Lauderdale are Monday - Friday 9:00 AM to 4:00 PM. Telephone (305) 771-0505. CSD is mailed worldwide on or before the 1st of each month, first-class (airmail). Annual subscription rates are \$50 (US funds) for USA, Canada, Mexico; \$75 (US funds) elsewhere. Entire contents copyright 1982 by West Indies Video, Ltd; Robert B., Susan T., Kevin P., and Tasha A. Cooper.

COOP'S SATELLITE COMMENT

- RECEIVER SUIT
- FCC MODULATOR APPROVAL
- LNA BLACKMAIL

SHOWED OUT

When an industry gets together, it is usually a healthy sign. It means there is at least enough esprit-de-corps for the participants to forget for a few days their intramural competition, overlook the rivalries which are bound to crop up in any competitive endeavor, and hopefully come together to pull together for some greater common cause.

During the recent NSOC '82 gathering in Fort Worth, the Board of Directors of SPACE met to discuss business before the trade association. One of the items marked onto the agenda was the status of the forthcoming SPACE industry trade show, to be held this coming August in Omaha. Some background is necessary.

Susan and I started the industry trade shows in August of 1979; before there was an industry. As someone pointed out at the SPACE Board meeting, we have an industry today because we had SPTS shows yesterday. Susan and I kept up the three-a-year pace for a couple of years, literally forcing the industry to yank itself up by the bootstraps. I remember vividly that Sat-Tec, ICM and other early receiver pioneers took each new SPTS show as a 'challenge' to bring out at least one, new, better than before, receiver. ICM's Royden Freeland chastized me severely for setting such a frenzied show pace, but each time he came to exhibit he had a better working product, for less money.

Because the SPTS shows were successful, we got ourselves an industry. Each show brought out a few hundred new, would-be dealers who walked around the exhibits making up their minds which receivers and LNAs and antennas they would handle at home, and this made the shows worthwhile for the exhibitors. The exhibitors went home with a pocketful of orders, the dealers went home with a starter set of equipment and the Coopers headed home to put the next show together. We wrote about what happened in the next issue of CSD, and then prepared for the next round.

From the outside, looking in, I am sure this looked like a pretty good deal for the participants. Everyone has their favorite story of who made it 'big' in the home satellite business. A few mis-informed souls put the Coopers into that list sure that we left the U.S. of A. carrying greenbacks in steamer trunks. The truth is far simpler than that, as far as we are concerned. We sold our house and two businesses and our household furnishings and with **that** bankroll moved south. In many ways, we saw the 'rush growth' coming and decided that we had done our part to get the industry started. And we would let somebody else carry on who wasn't as burned out as we had become.

One of the businesses we sold was STT. A fellow most of you know, Rick Schneringer, bought STT. Rick paid us a fair price, but if you are in business you know that buying a going business for less than 50% of the gross profit margin (last complete year) is hardly a bad deal for the buyer. Part of the STT 'package' is, of course, the thrice-annual industry trade shows.

Under Rick's total planning and implementation, the last three industry trade shows have been held in Omaha, Anaheim and Fort Worth. We'll celebrate the one year anniversary of his purchase of STT from Susan, the kids and I, this month. I don't ask Rick how he is doing, but having put on five of the shows ourselves before he took over, I can count heads and exhibit booths pretty good. I figure Rick should have his buyout price to me paid off and then some by now.

This should, and would normally, be pretty private stuff. You don't

tell me how you are doing and you probably don't care how we are doing. But this is not a normal situation, as we are about to see.

Last fall SPACE made the final decision. They **would** hold a trade show. I serve on the SPACE Board of Directors, and I concurred with that decision. What I didn't fully count on, or see coming, was the way that decision has encircled all of us.

First SPACE had to pick a date. Rick Schneringer, following our format, had divided the year up into thirds with roughly four month intervals between each of the three annual shows. SPACE looked at this and decided that they would move in on Rick's summer show. Nobody discussed this with Rick, even though that decision was apparently made in a meeting room in Anaheim provided and paid for by Schneringer, as part of his support of the SPACE effort.

Not being told, by an official SPACE entourage, was a mistake. It fell upon me to explain why **they** were 'moving in' on **his** show business. I botched it because the 'insider street rumors' concerning the SPACE show were far more up to date than my meager information; and I had been there when the decision was made!

To complicate matters, the street rumors first said SPACE would meet in Omaha, and then it was St. Louis or Chicago or Kansas City. The same rumors also had the dates for the SPACE show bouncing around between early June and early September. At this point Schneringer had a show scheduled, announced, and booked for Cincinnati for the last day of April, and the first part of May.

For several weeks Schneringer could not get any hard information from SPACE as to the precise location or dates. It later turned out there was good reason why they couldn't tell him; they didn't know either! In frustration, Schneringer decided St. Louis would probably be too close to Cincinnati, and early June was surely too close to May so he yanked all of his carefully worked out plans out of Cincinnati, and created the just passed Fort Worth show as a filler. An announcement, in this issue, pins down the SPACE show dates (very early August) and location (back to Omaha). But it takes months to put a show together, and Schneringer had to drop Cincinnati and move on to Fort Worth way back in December to allow the Fort Worth show to jell properly.

It is to everyone's credit that during the recent NSOC '82 meeting, SPACE rented their own room to hold another Board meeting, and they invited Rick in to discuss the mess. I thought Rick did a fantastic job of stating his case, pointing out that SPACE was in effect grabbing off one-third of his business income per year. Several members of the Board were openly sympathetic to Rick's plight. SPACE Prexy Tom Humpheries suggested that any supplier might feel equally threatened; what was to stop SPACE from entering the receiver business, for example, he asked.

The Board, acting on a suggestion made by Sat-Tec's John Ramsey, decided it would set up a clearing house for industry trade shows in the future. The suggestion was timely since there is a show in New England this month being staged by another new-to-shows group; SSB. SPACE has received numerous inquiries requesting that SPACE help promote shows, and send SPACE people to appear on the program. Appearing in a new forum is helpful for the SPACE cause, but there also needs to be a sense of order in all of this chaos.

The Rick Schneringer shows, the original shows begun by Susan and I, are certainly the established shows. They are not perfect, but

then what in life is perfect? Rick allows me to appear at these shows, and he feels my presence helps make the shows run more smoothly. SPACE, a non-profit group with no elected member of the Board being compensated in any way, or even for expenses incurred by attending Board meetings, also would like me to appear. SSB asked me to come to New England to appear on the program. It's easy for me to say no; I have a contract with Rick Schneringer which forbids my appearing elsewhere without his permission. So far, and I think correctly under the painful circumstances surrounding the development of the SPACE show, he has not given that permission.

Rick clearly is wounded in this affair. On the other side of the coin, virtually every industry of any stature has one major trade show a year, and that show is put on by the industry trade association. There is good reason for this; trade organizations need money to operate and a trade show is a good way to raise money. SPACE has been beset with financial worries from the first day it got started down at the Miami SPTS in early 1980. Big groups, such as the National Cable Television Association (NCTA) and National Association (of) Broadcasters (NAB) regularly raise up to 40% of their annual operating budgets with the net proceeds from their trade shows. SPACE could do the same thing if it can put together a decent show.

I thought up SPACE, brought Rick Brown to Miami to help get it started, and made sure it gets lots of 'space' and time at our SPTS shows and here in **CSD**. I serve on the Board, because people voted me into that position, and support most everything they do. And that includes the premise of the annual SPACE trade show.

However, I also support Rick Schneringer. He paid me good money for STT and I have no intention of doing anything which endangers his investment in STT. Rick feels that if I assist SPACE with their show, and appear there, I am endangering his investment in STT. Clearly I cannot do both justice in this matter so I see little alternative but to sit out Omaha. Through **CSD**, I'll support the SPACE show effort as best I can. But come show-time, I'll stay down here in the islands. Susan and I are kicking around the concept of staging a very small, select-group 'Satellite Retreat,' of our own, down here on Provo this

fall. Taking advantage of off-season hotel rates and off-season air fares, we figure we might arrange for no more than 30 folks to come down to Provo for five days or so, along about early October. It's just a wild idea at this point, but it has potential. If you think you'd be interested in spending a working-vacation this fall on Provo, drop me a line listing what topics you'd like to see explored in depth. No exhibits, no sales types on hand; just five days of intensive, hands-on learning in our pioneer environment. With the announced proliferation of satellite shows staring us in the face, this could become the 'class act' of them all!

OPEN LETTER TO TED TURNER

"Dear Ted:

On my wall is a note you penned to me back in 1977. It ends with the notation that a person can always tell a pioneer. He's the one with the arrows sticking out of his rear end!

I think you ought to know that RCA has improved their aim in the past few years. You've been in court with RCA from time to time, battling to win a place on first F1, and then F3R, for your CNN service. You won, but RCA doesn't forget so easily.

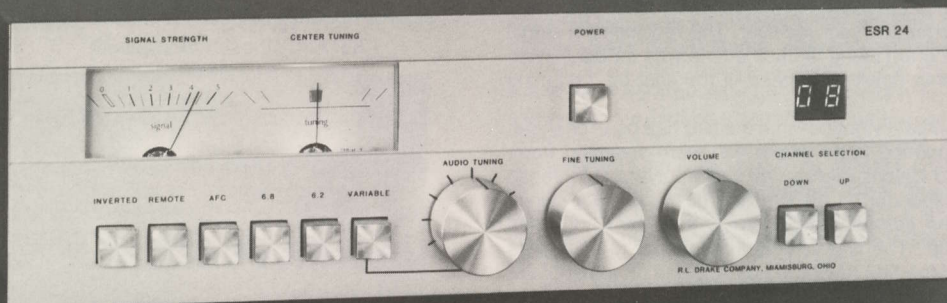
Ted, the transponder you are using for distribution of WTBS is sick. Actually, in all fairness to RCA, the whole antenna set (transponders 2, 6, 10, 14, 18 and 22) is either sick or badly ailing. I'm sure RCA hasn't told you that when F3R became operational, the WTBS signal on transponder 6 either went down in level, or stayed about the same level, from F1. Nor have they pointed out to you that F3R lowered your signal quality for many parts of North America, while every other transponder set came up; way up in many instances.

The net result is that America's true fourth network, the super station which is now seen in more than 20,000,000 homes, is having local cable distribution problems. The cable operators (bless their hearts) are blaming you, or RCA. And this reduced signal quality is going to hurt future super station growth; sooner, perhaps, than later.

Not only is your signal quality degraded, but of late it has been

CONTINUED/page 38

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WESTAR W4 ALIVE AND WELL!

W4 HAS FEW SURPRISES

Western Union's W4 bird gave the satellite industry very few nervous moments. The only 'fly' in the ointment of W4's activation was a badly timed rumor that swept portions of the industry on April 1; the story was that W4 "is sick." The story apparently had no foundation, and was begun either as an April Fools joke, or perhaps because the April 1 (0400 eastern) turn on time for W4 came and went and W4 was still not operating. The actual start up of W4 came at 0400 on April 5th and everything went off without a hitch.

This is the first Western Union 24 channel bird. It is different than other 24 channel birds in one significant area; for those of us who have grown up accustomed to finding **horizontal** transponders on the **even** numbers, and **vertical** transponders on the **odd** numbers, **W4 is backwards!** The odd numbered transponders are horizontal, and the even numbered transponders are vertical. Who says there is no creative engineering left in the satellite world!

Western Union has their own number system as well. We won't print it here, because it will only add further confusion to an already hopeless lack of standards in this seemingly simple area of standardization. Briefly, they call all of the horizontal channels 'D' channels and all of the vertical channels 'X' channels. That means they have 1 through 12 D, and, 1 through 12 X. In their own literature (which we hope sees little distribution!) they don't count beyond 12.

The W4 bird took over operations from the W1 bird at ten seconds past 4 AM eastern time on April 5th. The change over was less than dramatic. W1 went off at precisely 4 AM, and ten seconds later there was a replacement signal on your receiver. The replacement signal was W4. The only program being fed at the time was a PBS service which conveniently shut down just ahead of the shut off, resuming after the turn on.

Whether you immediately noticed that the bird had been changed on you probably depended upon where you were watching from. Here in the Turks and Caicos islands, we saw an average increase (transponder for transponder) in the **under 1 dB** range. Not significant. Initially, only the standard (PBS, Western Union) horizontal transponders were 'up.' The first vertical transponder to show was late in the morning of the 5th; KMEX in Los Angeles on transponder 6, zeroing in on the new bird for a feed for SIN.

To the more practiced eye the change over was immediately evident because the 'spinner signature' went away. Older WU birds maintain their position in space by 'spinning' their outer shell around (and around and around). They do this to create their own balance. As the outer shell spins, there is a 'rotary' joint on the bird which couples the receiving and transmitting energy from the respective antennas into the bird electronics. The rotary joint, on all WU birds and the older ANIK birds as well, 'wears' with use. It gets a lot of use; the birds spin, in place, at about once per second. You can (could) see this 'spinner' or 'rotary joint' action on a Westar bird; the signal sits there and goes up and down by a significant part of a dB as the bird spins.

When the W4 transfer was made, the signal levels stopped going up and down. W4 has no spinning problems.

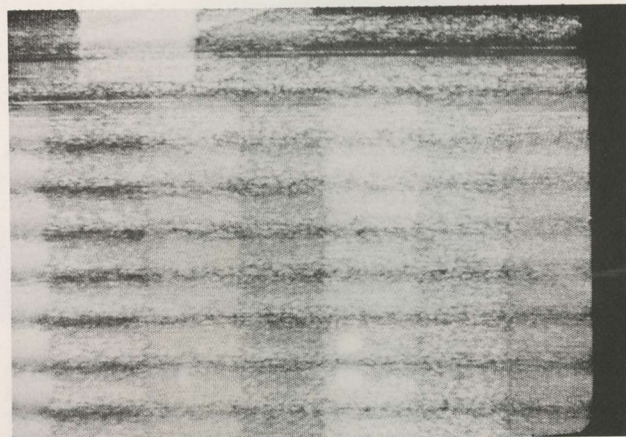


WESTAR IV turn on was anti-climactic. At precisely 4:00:00 the W1 bird shut off (only a single PBS channel was carrying programming at that hour) **and a few seconds later the service popped back on. On an unused PBS transponder, this slide was transmitted announcing that W4 had taken over the chores at 99 west.**

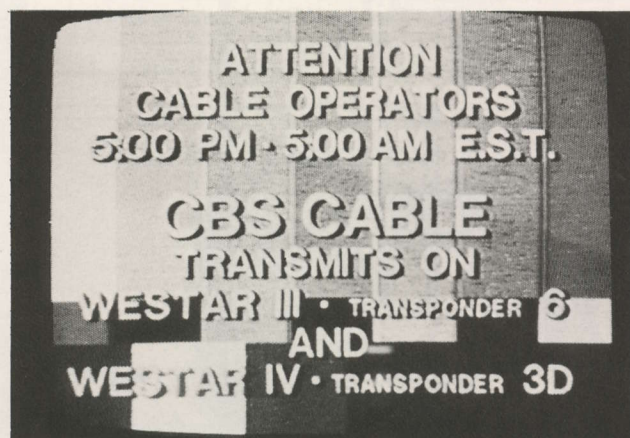
BIRD SWAPPING

Short of your being one of the relative few who might, by virtue of your location, experience a dramatic increase in signal level from W4 (versus W1), the most obvious change is the way the bird located at 99 degrees west is 'programmed' and used. The W1 bird, at that location, has been largely dedicated to PBS service (three full time and one part time transponders), and occasional (but regular and predictable) video from the three US networks, plus a host of special feeds for independent stations and programming and commercial agencies. Much of the later has also been shared, or split with, service on W3; at 91 west.

The long term goals of Western Union, with W4, are not yet announced. What they have done is to tell us what we can expect until at least the W5 bird is launched into orbit (this is now moved into June with a possible service date in mid to late July). The W5 bird will follow pretty much the same procedure as W4; it will be tested in the eastern edge of the orbit belt, and then drifted west to co-locate with the presently little-used W2 bird (123 west). Then W5 will take over the W2 chores, and W2 will be moved to some other 'old-satellite-home' to live out its remaining useful years.



CROSS POLE isolation, between vertical and horizontal signals, becomes especially important on W4. The amount of isolation, between the two polarizations, seems to be slightly inferior to Satcom cross pole isolation, placing a greater burden on the care with which you set the polarization rotation control.



SOME of the variety of W4 users seen during the first two weeks.

What we have been told is that **until** the W5 activation, the transponder use line-up is as follows (we list transponders as they will come up on your 24 channel receiver, noting for reference the vertical and horizontal transponders):

Transponder	Polarization	Service
1	H _z	Occasional video (WULATOC)
2	V _t	Hughes Network (little used)
3	H _z	Audio channels
4	V _t	Bonneville International
5	H _z	CBS Cable
6	V _t	SIN (US Network)
7	H _z	Equatorial Communications
8	V _t	Westinghouse(*)
9	H _z	SIN (Galavision)
10	V _t	Robert Wold (SelecTV, evenings, FNN daytimes)
11	H _z	Westinghouse(**)
12	V _t	American Satellite (data)
13	H _z	American Satellite (and WULATOC)
14	V _t	Westinghouse(**)
15	H _z	PBS (Schedule 'A')
16	V _t	Westinghouse(***)
17	H _z	PBS (Schedule 'B')
18	V _t	Westinghouse(*)
19	H _z	Robert Wold (see text)
20	V _t	Occasional video (WULATOC)
21	H _z	PBS (Schedule 'C')
22	V _t	SPN (Satellite Program Network)
23	H _z	PBS (Schedule 'D')
24	V _t	XEW-TV

Now the explanations, and observations. Westinghouse is the 'parent' buyer of the transponders 8, 11, 14, 16 and 18. Transponders in this set will be placed into service, in some format, beginning officially on June 21. Remember that the way Westinghouse is planning to program their '**Satellite News Channel**' service is to provide one 'national service channel' (reported to be transponder 11) and three regional channels. The national channel will provide the full, 24 hour per day, 'news bed,' like the basic CNN service on transponder 14 of F3R. The three regional service channels (reported to be transponders 8, 14 and 18) will feed six minute 'segments,' designed to be inserted into the master transponder 11 service. Each cable system will take a **single** six minute regional feed, automatically inserted into its master service, **each hour**. There are 24 'regions' in the USA, and between the three regional transponders, they will provide 24 regional feeds of 8 minutes length. Each regional will get its regional insert-feed once per hour. The fifth transponder (apparently to be transponder 16) will be the inward bound channel; used to feed news stories into the Satellite News Channel 'command central,' from field bureaus.

In the process of 'grouping' all of these services on W4, the W3 bird has been totally reconfigured. During April, those services that were formerly on W3, and intended in whole or in part for the cable industry, have moved over to W4. CBS Cable, for example, 'dual-fed' its service on W3 and W4 until April 12th, and then shut down the W3 feed. This has left W3 far less utilized. But that is a temporary situation. Western Union wants to get W5 into operation as soon as possible, and they reportedly plan to move many of the cable services over to W5. Westinghouse, in particular, is going there where it will also pick up an additional five transponders. With a total of ten transponders under its wing on W5, Westinghouse may well create the illusion of 'owning the bird.' Future Westinghouse growth plans for W5 includes the new 'Disney Channel,' to be launched early in 1983, and, the new 'Nashville Channel,' to be launched as early as this coming fall. Western Union is also asking for FCC permission to launch a W6 satellite, which it is felt would be wheeled into position to replace W3 (the last of the 12 transponder birds for WU); perhaps by mid 1983.

Even some of the other W4 cable directed services have future plans that do not include W4. SPN, for example, has reserved transponder space on the new Hughes Galaxy satellite and SPN's basic service, now on transponder 22 of W4, **may** well be moved to Galaxy at that time. CBS Cable **could** move to F4, where the parent CBS has reserved a channel. As always, 'musical transponders' seems to be a part of life in satellite-city.

PRELIMINARY OBSERVATIONS

A slight increase in signal level aside, the W4 bird brought us no apparent surprises. Of interest is that while the bird was located at 79 degrees west, during March, where it was tested prior to being drift-located to 99 west, the signal levels in the southeast (including the Caribbean) were far stronger; by as much as 2 dB. This is understandable; the bird has an antenna pattern which was custom designed for the 99 west location. At 99 west, it looks more or less 'squarely' into the central USA. At 79 west, it was off to the side and looking squarely into the eastern USA; bringing Caribbean and southeastern USA levels 'up.' Once again, it is not so much what bird you are, but more where you are, that determines how potent you are on the ground.

Most of the program transmission observations to press time pretty much verify the 'official' Western Union released list shown here. But some explanation or expansion is suggested. Robert Wold, leasing transponder 19, is perhaps the most creative provider of a variety of programming fare. During the daytime, transponder 19 carries such programs as **Entertainment Tonight** (mid mornings, again at 3 to 3:30 PM eastern), **Good Morning America** (10 AM to 12 noon eastern) and **Merv Griffin** (8 AM eastern). Also on this transponder is the **EWTN** (Eternal Word TV Network) in the early evening slot; and, the **EROS** service in the late evening period.

There has been a limited amount of ABC programming (other than Good Morning America, on TR19) seen on transponder 20; usually in the daytime slot. Some pre-release evening features show up there, as well as over on transponders (i.e. channel selector position) 17 and 19 on W3. What is apparent is that **most** of the

network traffic is **not on W4**; it has been moved to W3. The exact transponder-use pattern has not settled down at press time, but it appears that it may end up being similar to the following:

Transponder(*)	Use/Users
1	WULATOC (occasional video)
3	Occasional video
5	SCPC
7	no pattern yet
9	CBS (and others)
11	no pattern yet
13	no pattern yet
15	NBC (and others)
17	WULATOC, occasional video
19	ABC (and others)
21	CBN (and others)
23	Army Health Services (and others)

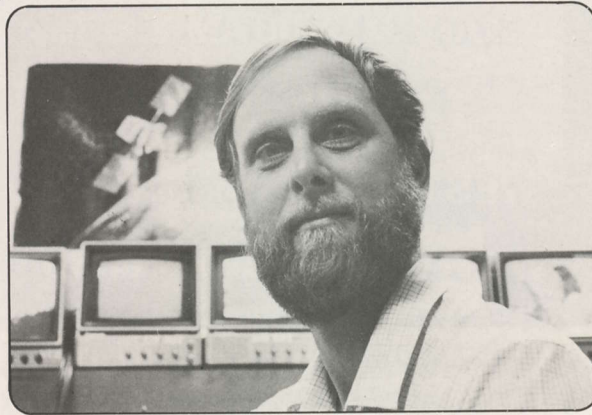
Many of the prior-to-W4 patterns have been broken. The Today Show, previously transmitted to the central time zone on W1 (TR9) weekdays has all but disappeared; parts of it show up on TR15 of W3. The only full satellite service of this, available continent wide now, is the transponder 8, F2 (119 west) feed to Alaska, carried by Robert Wold, 10 AM to 12 noon weekdays. CBS Morning News, previously

not seen on satellite, has been noted (along with the re-furbished Captain Kangaroo program) from 7 AM to 10 AM on transponder 9 of W3. The ABC World News Tonight feeds, previously carried on TR1 of W1, now appear on TR21, W3. Max Elliot, a mainstay of the ABC satellite feed for years, appears now on TR9 in the 6 PM to 7 PM slot; on W3. US AM, produced and carried by CBN (TR8, F3R) is now fed to the western time zone stations on TR21 of W3 up to 9 or 10 AM eastern. The Richard Simmons Show pops up on TR23 (Vidsat) on W3 at 8 AM eastern. Sixty Minutes, formerly on TR9 of W1, is found Sunday evenings at 10 PM eastern on TR9 of W3. And other occasional feeds, such as the VISNEWS London transmissions used by CBS and others in their morning news programs, have been seen on TR3 of W3.

What all of this tells us is that stability is not yet with us with the WU birds. Western Union will probably not make any final, firm transponder 'assignments,' or create any day to day patterns that will hold, until **after W5 is launched**, and the W4 to W5 service transfers are made. In the interim, if you are chasing baseball game feeds and other broadcast television services, your first place to look should be Westar 3 at 91 west, followed then by some of the occasional and Wold channels on W4. After the W5 bird launches and is put into service, it **may** all settle down for awhile!

DAVID'S TVRO VIDEO NOTES

by
David Barker
GHz Engineering



DISPERSAL ENERGY CLAMP PROBLEMS

One of the major problems associated with the receiver circuit designer utilizing a 'diode clamp' circuit for receiver rejection of the FCC mandated 30 Hz dispersal energy waveform is the damage such diodes can do to the vertical sync pulses. The FCC requires all US satellite operators to sub-modulate their satellite transmissions with a low frequency (30 hertz per second rate) modulation signal. This is done to 'spread' or 'disperse' the satellite energy over the full 36 megahertz wide satellite transponder. The object of this is to insure that the energy from the satellite transponder does not 'bunch up' in one narrow place within the transponder spectrum, where it might (the FCC believed, back in 1970) cause some interference to terrestrial microwave systems operating in the same portion of the spectrum.

The **vertical sync** is a pulse of signal, for a very brief duration, which tells the television receiver how the vertical scanning of the picture should be 'timed' with the composite video signal. The vertical sync pulse insures that each new 'line' of picture starts at the same spot on the screen, and this in turn results in a picture that has each successive line of video (from top of screen to bottom) neatly 'stacked' below the preceding line. Without the vertical sync pulse, your picture would be a hopelessly distorted image. And in fact, many of the scrambling techniques employed take advantage of this fact to 're-arrange' the start, and stop, points of each successive line during scrambled transmission; the decoder puts them all back, right, again.

For background, a complete television image, as viewed on a receiver screen, is called a frame. A frame consists of two separate, interlaced fields each consisting of 262.5 lines of video information. The image making up a frame is actually two separate images, one

transmitted after the other. This happens at a 60 hertz per second rate. With two 'half pictures' transmitted 60 times per second, we then have a **full (new) picture every 1/30th of a second.**

There is the problem of removing the FCC mandated 30 hertz dispersal waveform, and yet maintaining the 30 hertz frame rate energy. A diode clamp, costing under \$.75 for the diode, is an inexpensive way of shutting off the 30 hertz energy dispersal waveform or signal, but it can and does cause problems in many receiver designs. And this is true whether the diode clamp is followed by a field effect transistor (FET), or, a bipolar type of video amplifier.

This damage, caused by the properties of the diode (most any diode chosen is less than perfect for this application) is independent of the video level coming through the clamp circuit. Thus, if the video level through the clamp is increased, the damage becomes a smaller part (i.e. percentage) of the video level. The easiest way to verify this is to add a 3 dB pad in the video line going to a monitor (or modulator), and then turn up the video gain 3 dB to return to the original level. This simple 'fix' might stop a projection TV set from 'rolling', or allow recording on a home VCR when without the fix you can't see to get sync stability on the recorded product. The pad should be a 75 ohm type, good (by design) to 'video'.

You can detect a receiver that is having 'clamping problems' by observing the picture closely, on a strong signal. If you see a minute amount of jitter in the picture, that tells you that somehow the clamping circuit is failing to remove **all** of the 30 hertz energy dispersal waveform. Different people have different perception 'rates' for the 30 hertz jitter that hangs in there, usually just below the eyeball threshold level

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SATELLITE CHANNEL CHART

JAN/FEB 1982

1	WU WESTAR 3 (91°W)	Polarization: All Horizontal
TR-2(3)	HUGHES SPORTS NETWORK—sports events feeds (5 2/6 B)	
TR-3(5)	OCCASIONAL TRANSMISSIONS—sports events, news & net	(5 2/6 B)
TR-5(9)	KEW-TV, Mexico City—Mexico's leading network station (5 2)	
TR-6(11)	OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)	
TR-7(12)	CBS CABLE—performing and cultural arts programming (5 B mps stereo/6 B)	
	ROBERT WOLD COMMUNICATIONS—occasional transmissions: sports events, news &	
	SELEC TV—STV feed: first-run movies, concert specials, & sporting events (5 B)	
	FNN (Financial Network News)—financial/business news with stock market readings (5 B)	
TR-8(15)	SIN (Spanish International Network) (5 2/6 B)	
TR-9(17)	SPIN (Satellite Programming International Network) (5 2/6 B)	
TR-10(18)	ABC Network	
TR-11(21)	CNN (Cable News Network) (5 2/6 B)	
TR-12(23)	OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)	
	STUDIO 11B	
	EROS—adult	

ATT/GTE COMSTAR

TR-1V(1) NBC Network

Numbers appearing in parentheses indicate actual dB.
Numbers in parentheses indicate particular service.

SATELLITE CHANNEL CHART

JAN/FEB 1982

3	WU WESTAR 1 (99°)	Polarization: All Horizontal
TR-1(1)	OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)	
TR-2(5)	OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)	
TR-5(9)	OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)	
TR-6(11)	OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)	
TR-8(15)	PBS (Public Broadcasting)—schedule A programming (5 B)	
TR-9(17)	PBS (Public Broadcasting)—schedule B programming (5 B)	
TR-11(21)	PBS (Public Broadcasting)—schedule C programming (5 B)	
TR-12(23)	PBS (Public Broadcasting)—schedule D programming (5 B)	
	PBS OCCASIONAL FEEDS (5 B)	

ATT/GTE COMSTAR

TR-1V(1) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-1H(2) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-2V(3) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-2H(4) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-3H(6) BRAVO—per-

TR-4V(7) NCN (National

TR-5V(9) ESCAPADE—

TR-6H(10) THE PLAYBOY

TR-7H(12) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-8V(15) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-9V(17) TBN (Trinity

TR-10H(18) HOME BOX

TR-10V(18) AMERICAN

TR-10H(20) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-11V(21) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-11H(23) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-12H(24) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

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SATELLITE CHANNEL CHART

JAN/FEB 1982

5 Audio Services on SATCOM 1

TR-2	SATELLITE RADIO NETWORK (5 2)
TR-3	SATELLITE MUSIC NETWORK—Popular music (5 5B/5 7B stereo)
	SATELLITE MUSIC NETWORK—Country music (5 5B/5 12 stereo)
	WFM (FM), Chicago (5 3/6 4B stereo)
	Bonneville's "BEAUTIFUL MUSIC" (7 3B/7 5B stereo)
	Seaborg's "LIFESTYLE" Music (7 6/9B)
TR-6	MOODY BULE INSTITUTE RADIO (5 5B/5 7B stereo)
TR-8	CONTINENTAL BROADCASTING (5 3/6 4B stereo)

ATT/GTE COMSTAR 4 (127°W)

Polarization: ODD—Vertical
EVEN—Horizontal

NO VIDEO

WU WESTAR 2 (123°)

TR-2(3) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-3(5) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-5(9) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-6(11) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-8(15) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-9(17) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-11(21) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

TR-12(23) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)

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TR-12(23) OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)



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**SATELLITE
CHANNEL
CHART**

THE MOST ACCURATE AND UP-TO-THE-MINUTE LISTING OF
ALL PROGRAMMING SOURCES AVAILABLE ON THE SATELLITES

Vol. 2, No. 1

JAN/FEB 1982

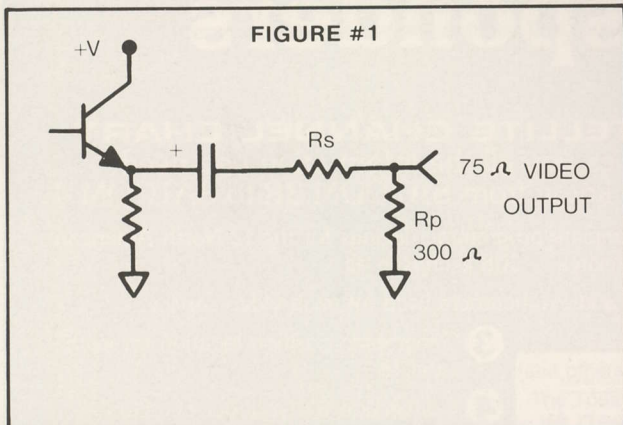
Issued 1-1-82

RCA SATCOM 3R (131°W)

6 Polarization: ODD—Vertical
EVEN—Horizontal

TR-1	NICKELODEON—premium children's programming (5 B)
TR-2	ARTS (Alpha Repertory Television Service)—performing and cultural arts programming (5 B)
TR-3	PTL (People That Love)—religious (5 B)
TR-4	WGN—TV, Chicago—Midwest's leading independent station (5 B)
TR-5	SPOTLIGHT—first-run movies, concert & entertainment specials (5 2/6 B)
TR-6	THE MOVIE CHANNEL—24 hr/day first-run movies (5 B & 6 B stereo)
TR-7	WTBS, Atlanta—Ted Turner's Superstation (5 B)
TR-8	ESPN (Entertainment & Sports Network)—24 hr/day sports (5 B)
TR-9	CBN (Christian Broadcasting Network)—religious (5 B)
TR-10	C-SPAN—live coverage from the House of Representatives (5 B)
TR-11	USA NETWORK—professional sporting events, College and the English Channel (5 B)
TR-12	BET (Black Entertainment Network) (5 B)
TR-13	SHOWTIME (West)—first-run movies, entertainment specials (5 B)
TR-14	MTV (Music Television)—Pop/Rock Video (5 B & 6 B stereo)
TR-15	SHOWTIME (East)—first-run movies, entertainment specials (5 B)
TR-16	HBO (Home Box Office/West)—first-run movies, sports & entertainment specials (5 2/6 B)
TR-17	CNN (Cable News Network)—24 hr/day news (5 B)
TR-18	CNN II (Cable News Network second service)—CNN headline news (5 B)
TR-19	SHOWTIME (Spokane)—occasional network remote and sports events feeds (5 B)
TR-20	AETN (American Educational Television Network) (5 B)
TR-21	CRN (Christian Media Network)—religious (5 B)
TR-22	NJT (National Jewish Television)—religious (5 B)
TR-23	GOOD STUFF—premium children's programming (5 B)
TR-24	WOR-TV, New York—the Big Apple's top independent station (5 B)
TR-25	CRN (Cable News Network)—live coverage from the House of Representatives (5 B) (est. Feb. 1, 1982)
TR-26	REUTER'S MONITOR SERVICE—commodity/stock market information (digital video)
TR-27	GALAVISION—the best in Spanish-oriented programming (5 B)
TR-28	OCCASIONAL TRANSMISSIONS—sports events, news & network feeds (5 2/6 B)
TR-29	C-SPAN—live coverage from the House of Representatives (5 B) (est. Feb. 1, 1982)
TR-30	HOME BOX OFFICE CINEMAX (East)—time structured HBO (5 B)
TR-31	HTN (Home Theatre Network)—quality P and PG movies (5 2/6 B)
TR-32	THE PREVIEW CHANNEL—TV & motion picture previews (5 B)
TR-33	THE WEATHER CHANNEL (est. Spring 1982)
TR-34	MBN (Modern Satellite Network)—general entertainment (5 B)
TR-35	DAYTIME—programming for women (est. Mar. 15, 1982)
TR-36	HBO CINEMAX (West)—time structured HBO (5 B)
TR-37	HBO (East)—first-run movies, sports & entertainment specials (5 B)

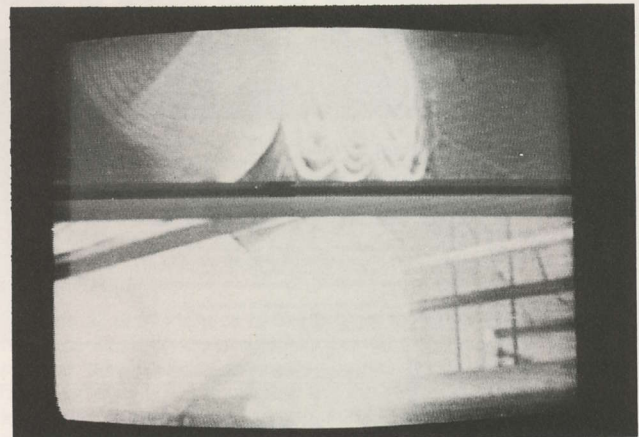
FIGURE #1



for most home TVRO receivers. In other cases, due to individual circuit component variations, or inadequate receiver clamp design, you see the effects of the 30 hertz waveform no matter how good (or bad!) your eyesight.

This simple 3 dB 'fix' is limited to about 3 dB because the NE-592 devices used in most receivers have a limit of 3 volts video peak to peak output. Most receivers are set, by the factory, to a 1 volt peak to peak output; to drive an external modulator/monitor, or to drive an internal modulator. By raising the video gain 3 dB, you come close to the 3 volt absolute limit of the NE-592, and then by adding the 3 dB pad you end up back at the output spigot with the modulator/monitor required 1 volt output. The NE-592 still has the 30 hertz dispersal waveform included, with the video, when it operates.

To make the fix, refer to **figure one**. This change can be made inside of the receiver. Normally, all that you will do is change a pair of resistors in the video output circuit. The changes are shown in figure one. Rs should be adjusted so that the video level drops to exactly one half the voltage previously measured, after the 75 ohm termination is



BLANKING BAR . . . vertical sync pulse is bent by clamping circuit. See text.

added. If this happens to be 'too much fix' for the particular receiver you are working upon, try an Rp of 430 ohms and an Rs of 91 ohms. This will give you a net improvement of approximately 2 dB.

Figure two is a photo of a blanking bar with the vertical sync pulse (darker bar in the upper half of the blanking bar); it shows the result of sync damage done by a clamping circuit. The video waveform has been 'bent' during the vertical sync pulse, and as a result the blanking after the sync is not as dark (black) as before the sync pulse.

This series in CSD will continue with a review of the entire video section of a typical satellite receiver. A better understanding of the video waveforms, and what a receiver does in processing the video and attendant sync signals, will better position you to diagnose field problems, and often to make field modifications which will result in better pictures in customer homes.

WHAT HAPPENED IN FORT WORTH?

ARE SHOWS CHANGING?

Industry trade shows, have from the first SPTS in August of 1979, been an important part of the industry's growth. There have been complaints about how shows are run, where they are held, and what information is scheduled into the 'seminar' or teaching portion of a seminar. Much of it had at least some validity.

At the first SPTS, approximately 500 people turned out to crowd into the South Oklahoma City Junior College facility. There was seating for 340. At least 100 spent most of their three days with H. Paul Shuch, early-industry-technical Guru who preached the science of system design. At the first seminar, every topic taught was standing-room-only. Nobody knew anything, so everything said was interesting, and worth consideration. The first seminar had 8 exhibit booths, including (believe it or not) Scientific-Atlanta (!). "Booth" is a



mis-nomer; each of the exhibitors used table-top displays to show off their hardware. Out of the exhibitors, two found the SPTS gathering response substantial enough to launch them into the same business they are in today; AVCOM and ICM.

Almost everyone attending the first SPTS had an (intense) technical interest in the subject matter. Virtually none of those attending had their own terminals; only a small percentage had ever seen satellite television before. People spent hours just gaping (and gasping) at the handful of operational terminals in Oklahoma. One of the antenna suppliers (Jim Vines' Paraframe) drew ooohs and aaahs when he managed to locate ANIK with his dish. "Imagine that . . . television from Canada, in Oklahoma!" people exclaimed. Very few knew that this was the first time Vines had ever had electronics connected to his satellite dish. He finished his first antenna only hours



Videophile Satellite Television

The possibilities of component audio come to satellite video.

Component equipment has become popular in the audio field for a lot of reasons. One reason is that the component philosophy allows a purist to upgrade any piece of a system as technology advances without having to replace the entire system at once. This basic idea has ushered in an era of specialty firms dedicated to advancing the art of a single link in the chain. They succeed because all of their efforts are focused on one discipline, not thinly spread over an entire system. EARTH TERMINALS™ brings this philosophy to satellite television. We concentrate on the single most important, most difficult element—the microwave receiver. No other part of the system has such a dramatic effect on picture quality.

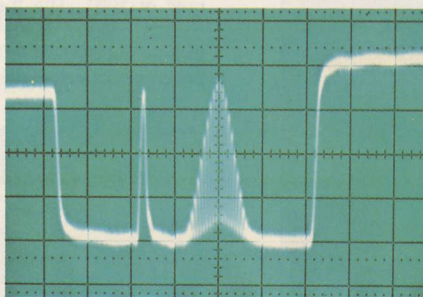
Quality You Can See

An EARTH TERMINALS receiver provides cleaner pictures with less granularity. Truer colors that don't smear. Less sparkling snow on weak programs. Complete absence of herringbones and waves. Superimposed lettering that doesn't tear at the edges. In fact, you haven't seen video this exciting unless you've been in a television studio. If you own a quality video projector, you'll be even more impressed.

Quality You Can Measure

Broadcast engineers are impressed with the accuracy of EARTH TERMINALS receivers too. Our VITS Sin² Pulse and video SNR test results are incom-

parable; actually the equal of most commercial grade receivers. We can also handle tough signals like Reuters data transmissions that give other receivers fits. It's no wonder then, that after exhaustive testing, some cable companies and television stations use EARTH TERMINALS receivers as their main source of satellite program material. They know value when they see it.



Unretouched Off-The-Air Sin² Pulse Test

It's Easy To Live With

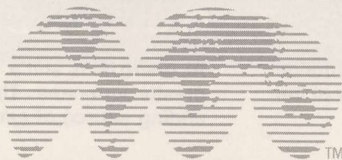
All this technical sophistication is really quite easy to get along with. Precise automatic fine tuning tunes every channel the same way every time. You don't have to be an expert to get perfect

pictures. EARTH TERMINALS receivers come with a remote control that selects channels individually, adjusts audio volume at your convenience, and automatically signals the rest of your system to supply the proper antenna polarization through an even/odd channel switch. And it fits in the palm of your hand.

Tips On Value

There are plenty of satellite receivers that cost less than ours, but nearly all of them need bigger antennas and more exotic Low Noise Amplifiers for a picture free of sparkling snow. If you're on a budget, you can save money in other parts of the system by paying more for our receiver and come out even. You get high fidelity video in the bargain. If you're simply after the best picture money can buy, we can make it very affordable. Either way, give us a call or write us for the details.

EARTH TERMINALS
Department 103
255 Northland Boulevard
Cincinnati, Ohio 45246
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EARTH TERMINALS

before the first show!

It took guts to be at the first show with a product. People such as Andy Hatfield of AVCOM had no concept whether there would be a market for their products. Firms such as Scientific Atlanta were not really sure why they were on hand; they were the only people selling complete home terminals in those days, and they had sold fewer than a dozen. Most of those had gotten them in trouble with HBO et al. The only thing we all knew was that the system **did** work, and, that hundreds of people were very interested in it. Beyond that . . . it was all guessing.

The first seminars, on through Miami in February of 1980 and San Jose in July of 1980, were very educational. People who were designing equipment were willing, even anxious, to share it with others. There was a 'family atmosphere,' with virtually anyone who knew something special more than willing to share that something with anyone who asked. But all of that changed by the Houston SBOC gathering in November of 1980.

The Houston show was clearly a show to attract new people into the retail, dealer business. Competition between suppliers surfaced, and there were the first of the angry words exchanged, at the Houston show. Some of the suppliers, and would be suppliers, felt threatened by the emergence of new-to-the-field suppliers, and competitive juices flowed deeply in Houston. The seeds planted in Houston would be with us from that point forward.

As an industry, it became apparent that information had value. Up to and through Houston, people appearing on the seminar / conference programs shared their experiences willingly. There was a free-flow of information, and few of those appearing on the rostrum had something to sell. There were no ulterior motives. What was presented was brought forth for the good of the industry; for the



LIGHT GETS LIGHTER — many of the newer antennas are trying to reduce the weight of the parabolic super structure, while still maintaining surface accuracies required. It is no simple task when you have more than 100 moving parts!

growth and maturity of the industry.

The next gathering was in April of 1981. The meeting was held in Washington, D.C. The rationale was that the industry needed a few friends in high places. Our own growth was attracting opposition forces. HBO was leading an attack on home terminals, and other premium (and not so premium) program suppliers were joining the chorus. There was a short-lived industry interest in low power TV at Washington, the result of late fall FCC approval of LPTV broadcasting. The interest died quickly, however, when it became apparent that LPTV was going to be bogged down in bureaucratic red tape for many years. The Washington SPTS gathering marked a turn about in seminar sessions. Other than a handful chaired by Taylor Howard, the obvious intent of many sessions was to sell the audience a product or service. There was more than a little (negative) feedback from this change; many of those attending were still 'first timers,' and they were anxious to buy, but only after they had acquired a basic education in what was 'truth' and what was 'type.' The industry was clearly being taken over by the hypesters.

The SPTS planning force saw this reaction, and attempted to redirect the industry trade show at the next location; Omaha in August of 1981. The theme of the Omaha show was "Back To The Basics." Many of the seminar sessions held concentrated on this theme, but the switch 'backwards' may have been overdone. Now the people who already knew "the basics" were unhappy because they



EARLY ON — long before the record breaking 60+ outside antennas were installed and operational, this was the view of the entry way to the Tarrant County Convention Center.



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INSIDE ANTENNAS — including this 20 foot ADM 'monster,' were a new feature at the Fort Worth show. No, they did not get pictures through the metal roof!

didn't have an opportunity to listen to the "hype"! Seemingly, finding a middle ground was going to be a difficult task.

It was during the Omaha SPTS show that the subject of **another** national show, to be planned and conducted by SPACE, first got off the ground. SPACE had been fighting a budget-battle for over a year. The meager funds coming in, from individual and corporate members, was proving to be far below the level the Board of Directors felt was required to mount a determined offensive against the HBO (et al) foes. SPACE VP, and General Counsel, Richard L. Brown was pushing for a national SPACE trade show. Brown argued, effectively, that a show had the potential to raise a big chunk of the trade association's annual budget, and, improve the membership services provided to SPACE members.

As discussed by Coop in his 'Comments' section this month, all of this finally came to a head at the Anaheim SVS gathering last November. The just passed Fort Worth show was the last SPTS/SVS/NSOC until this coming fall. To bridge the gap, SPACE is scheduling its first 'annual' industry trade show and conference, in Omaha, this coming August 5, 6 and 7. The industry, clearly, may never be the same.

The NSOC '82 gathering was patterned much like the 1980 Houston SBOC. It was intended to be a dealer show, designed to provide entry-level dealers with the background and tools they would need to mount a successful business. What happened was intriguing to observe.

Number one — by repeated show of hands, someplace between 60 and 80% of those attending conference sessions were attending their first conference/seminar. Meeting attendance varied between a low of perhaps 50 at some of the (very) early Sunday morning sessions, and as many as 600 at other sessions.

Number two — at those sessions where extensive audience participation was encouraged (i.e. questions asked from the floor), the audience played a key role in the direction the information flow went. In antenna sessions, in particular, people were clearly confused and perhaps disturbed by the tremendous selection of antennas on hand (more than 70 in all; the widest selection yet!), and, the conflicting claims many made for their antenna products.

Number three — show attendees were plainly confused, also, by the seemingly 'loose,' even hap-hazard, manner in which many of the exhibitors floated their product pricing. Prices on LNAs, receivers and antennas eroded during the show. Many who bought or ordered early (such as the first day) were later upset that they had paid too much; had they waited one or two days, they might have bought comparable product for less money.

Number four — new product announcements were confusing. Dealers saw or heard or overheard **distributor pricing**. The handful of retail buyers who filtered in under the single-day passes often went away with false impressions of what the equipment would cost them; especially if they were going to buy a turn-key system.

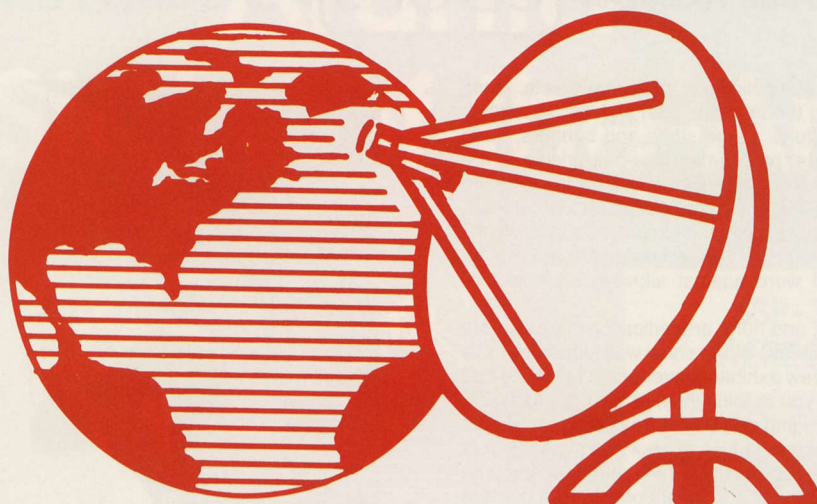
Number five — the CableText seminars, scheduled on Friday, were at best difficult to understand. The presentations dealt with few hard facts, and it quickly became apparent that the services offered, or, **to be offered** on CableText had not yet grappled with the prospect of authorizing (for a fee) individual, home terminals. Clearly, the CableText folks were ready to sign up customers, but they had not prepared their case very well. Dealers who liked what they heard got no solid answers on product cost, availability, or how they would go about ordering it for a customer.

Number six — too many of the sessions were blatantly self-serving. Many of the Saturday afternoon sessions were designed less to educate than they were to 'sell'; not in itself a disagreeable approach. However, when the sales pitches become podiums for one-company dissertations on the state of the industry, and opinions were offered as fact, there was some obvious attendee disgust.

Number seven — the industry is torn between having a high degree of visibility, and, making the shows self serving. It is apparent doing both is very difficult; perhaps impossible. High visibility shows, held in downtown convention centers such as the Tarrant County Center, have built-in problems. A lack of antenna display space, jamming displays outdoors up against busy street traffic, and locating a show directly under Bell telephone company microwave antennas are some of the more obvious problems. Sharing a large (call it huge) convention center with a religious book convention was a less obvious, but occasionally unnerving problem.



WE WERE REALLY downtown! In fact, less than 2/10ths of a mile away a Bell microwave link, nearly 400 feet above the Convention Center, pumped out interfering signals that gave most of the antenna systems fits.



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Number eight — industry self policing is another problem. Many of the newer firms entering the field are from highly competitive, very motivated business areas. Large signs and banners, hung across street side antennas, proclaiming low-ball pricing in the \$400 range for antennas, LNAs and receivers, drew the criticism of exhibitors and dealers alike. Frank discussion of such marketing tactics, at the shows, came out in the closing "Coop Session" on Sunday. No vote was taken of the attendees in that session, but the feelings displayed were against allowing such 'public-visible' promotion.

In spite of these negatives, and none are indications of any more than industry growing pains, the Fort Worth show was judged by most to have been a success. Very few exhibitors ever admit to having had a 'bad show.' They don't want you to think they, or their products, did badly. There is, however, a fine and discernible line between "we did fine" and "we did great." The superlatives grow when the exhibitors feel they really did make the sales to support the expense and time the show required. Many felt that way about the Fort Worth show; and if the number of 'first-time-attendees' raising their hands in sessions was a true survey, there was plenty of 'fresh meat' at the show to fill the order baskets of exhibitors.

TOO MANY?

The exhibition phase of the industry shows have become more and more important to attendees. The program for NSOC '82 listed 91 exhibitors, taking up 117 booths. Now the important number; 62 of the 91 exhibitors, listed their product line as "Total Systems." That means, if the exhibitor listed his booth properly, that he offers antennas plus LNAs plus receivers; and often, all of the accessories.

Clearly not all of these 62 exhibitors manufacture their own antennas, and offer someone else's receivers and LNAs. But a surprisingly high number do now manufacture antennas. With more than 70 antennas on hand, set up, either outside in front of the building, or spread through the huge inside hall, an attendee was seldom out of sight of a fiberglass or metal reminder of his heritage.

While fiberglass antennas still dominate the show, there was a high number of frankly quite innovative metal antenna designs. People are grappling with the problems presented in shipping heavy, solid fiberglass panels or antenna sections, and many are looking for weight and size assistance in the form of aluminum. One of the more innovative approaches to the erector-set assembly problem was offered by John Felter of International Earth Stations (Houston, Tx). Felter has devised a way to quickly assemble a very high quality metal dish structure while on the ground; but with the dish on its mounting system. It proofs itself, and many will probably copy some or all of his approach before the next show!

There are probably too many antenna lines now in the field. Too many, in the sense that most of the antenna producers have very low production capacity, and national sales aspirations. Two years ago antenna Guru Nelson Ethier suggested that building antennas in one's garage was "the perfect cottage industry." Apparently many people took the Guru's advice!

Here is some more advice for those antenna suppliers. Two years, even one year, ago... the 'market' was too small to probably support a full commercial antenna endeavor in a **state** area. But the industry base is growing rapidly. A firm that builds a good antenna, and markets it through a closely knit, **nearby** network of installing dealers, can survive simply by taking care of customers within a 100 to 200 mile radius. Deal with dealers who are close enough to drive after their antennas, when they need them, and to whom quick service and 'near-by' factory backup is important. Stay out of the big, nationwide market, which will only spread you so thin as to make it impossible for you to survive. This is the one way you can compete with the big, national lines. Then to increase your market penetration, set yourself up as a distributor for a good line of receiver(s) and buy LNAs from one of the firms that offers discounts for the quantities you can supply to your dealers. Someday, perhaps, you will build a business foundation that will allow you to become a 'national' antenna supplier. Too many of those jumping into the field with the second antenna they ever produced are running to the first 'national show' they see, and attempting to run long before they walk. Don't screw yourself up by being overly ambitious!



VIRGIL RICHARDSON (right) directs the final polishing of the in-booth antenna at the H & R Communications display.

RECEIVER SLEEPER

One of the most interesting, and perhaps least touted, new electronic products on display at Fort Worth was an intriguing new receiver from Sat-Tec; the R-2000. John Ramsey has been a major producer of lower cost receivers for more than two years now (that makes him a real veteran here), starting with the R2 unit. None of John's receivers have been outstanding performers, but they have all been good to excellent values. John has stayed almost totally in the 'under \$1,000 retail' price range for receivers, and when the distributor pays around half that for the product from Sat-Tec, that never left much margin for John to turn his products into really top performers. We figured John was happy to have a lion's share of the low-end market, and while we have a good selection of Sat-Tec products down here and have done some amazing things with them, we were not prepared for the R2000 seen at Fort Worth.

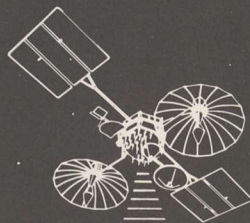
The R2000 is a double conversion receiver in a classy new case that puts it into 'looks contention' with any of the sleek, new brushed aluminum consumer oriented products. It uses a remote down-converter, has a full front panel tunable audio system, can be remote controlled, offers an optional plug-in RF modulator and includes de-tent channel tuning and a signal strength meter. What most impressed us, right after the appearance ("That does NOT look like a Sat-Tec product, John," we heard numerous people exclaim), was the performance. Now a show is a lousy place to show off a receiver's abilities. You have no way of knowing, without spending a great deal of time exploring the individual lash-ups, whether the exhibitor got very lucky, or very unlucky, with his particular antenna connection. We satisfied ourself that the Sat-Tec booth had nothing going for it in the antenna department, and then judged the new R-2000 receiver to have one of the best pictures at the show. John has solved the discriminator problems that have plagued many of the lower cost receivers, and video quality is excellent.

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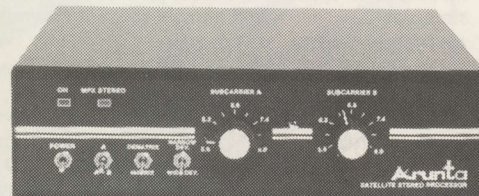


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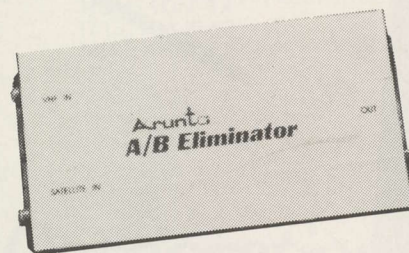
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We also admired the straight-forward way that Sat-Tec presented their pricing structure to NSOC '82 attendees. A printed sheet handed out to all attendees made it clear that you obtain discounts when you purchase quantities of product. For example, for the R2000 is \$895 suggested retail. The hand out explains that you can purchase a dealer sample ('... to recognized dealers') at \$695, or as a bonafide dealer (five per shipment) at \$595, or, as a distributor (40 units every sixty days; 5 per week average) for \$540. And there are additional discounts (10%) for orders prepaid with guaranteed funds.

This takes the mystery out of how a dealer (or distributor, who is in truth a 'volume' dealer) will be treated. Sat-Tec should be recognized for both innovation in product design (more about that after we've had an opportunity to test the R2000 and a companion S2000 stereo demodulator), and straight forward marketing.

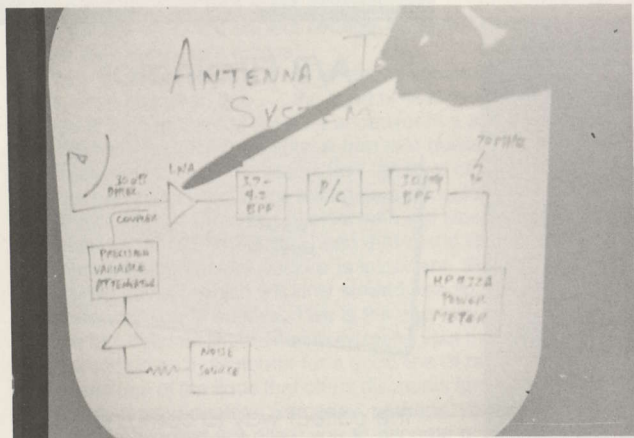
ANTENNA TESTS / PART TWO

The first industry antenna tests were conducted at the Omaha SPTS this past summer. In that testing sequence, approximately 15 of the 50 or so antennas in operation on the antenna lot were measured for 'relative gain.' The technique used for the testing was detailed in the September (1981) issue of **CSD** and it has been carefully scrutinized by most of the antenna pros in the business. Very few people have an academic problem with the testing system, developed by Mike Gustafson and Jack Trollman. The duo was back in Fort Worth to have another go at the testing.

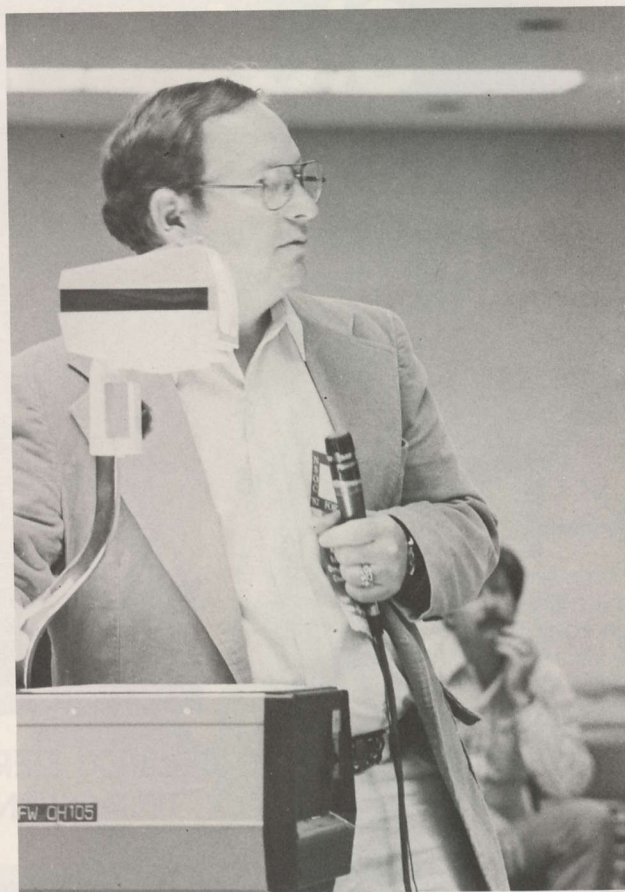
Several of the 'parts' changed in Fort Worth. The test procedure and equipment was virtually identical to Omaha. But, since Omaha the bird has changed (F1 to F3R). There was a high level of terrestrial interference at the Fort Worth site. The very tight antenna display area in front of the Tarrant County Center placed antennas 'elbow to elbow,' and this increased the possibility of single conversion receiver radiation interference. Finally, it was cold and it rained; cutting to under half the ultimate antenna-test-time available. In Fort Worth, tests were completed on only 11 of the antennas. More than twice that number had 'signed up' for testing.

In the September (1981) issue of **CSD** we reported on the testing results in Omaha, and presented a graph displaying how those antennas tested did. You may recall that one of the conditions of the show testing program is that no specific antenna is identified by brand or model. Antennas are assigned a number, and when the tests are over, results are shown by number only. The manufacturer of each antenna is provided with his own results.

What value is that, to attendees? As Mike Gustafson noted during the Sunday wrap-up session, the 'trend' in Fort Worth (in spite of weather and interference problems) was 'up.' That is, more of the antennas tested on the 'high side' of the graph curve this time. Mike feels that this means antenna manufacturers are getting a better handle on making their products perform. To back this up, he notes that one of the antennas tested in Omaha (it did not-so-good there)



ON THE SCREEN — Mike Gustafson uses a pointer to take attendees through the antenna test measurement sequences displayed in graphic form.



MIKE GUSTAFSON explains how antenna test comparisons are made and what the results really mean.

was back for a second shot in Fort Worth. And it showed a definite improvement.

Will specific results ever be released? Mike and Jack Trollman believe they will. Trollman notes **"I believe that after one more session of testing, we can begin to at least release to the attendees a qualified rating of antennas."** How might that work? "If an antenna has been tested at least twice, out of the three testing sessions, we will have a handle on that antenna under a variety of situations and conditions. We are suggesting that perhaps we can then release data which states that the antenna is "better than," "average," or, "below"; reference the 'norm' of all antennas tested, and the theoretical performance expected.

In Fort Worth, of the 11 antennas for which tests were completed:

- 1) **Five were 10 foot in size.** Performance varied over a 4.5 dB range (that's not impressive), with two falling at or above the theoretical performance line.
- 2) **A single 11 footer** was tested. It fell very close to the theoretical performance.
- 3) **One 11.5 footer** was tested. It fell slightly below theoretical performance.
- 4) **Two 12 footers** were tested. One fell close to theoretical performance; another fell more than 2 dB above theoretical performance.
- 5) **One 13 footer was tested.** It fell above the theoretical performance point.

In looking at the 'hard' CNR numbers (the measurement of actual received signal strength; a real-world number), the top performing antenna tested was the 13 footer. It produced a 14 dB CNR on the test transponder (24 on F3R). Second 'best' was a 12 footer that produced a CNR of 13.75 dB. Third best was a ten footer that managed a 13.2 dB CNR. The worst CNR number came from another 10

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footers; a 8.6 dB CNR reading.

The 'wide spread' in 10 foot antennas 'bothered' the testing pros in Omaha. The nearly 5 dB spread in Fort Worth was also a significant range of results. Antennas that test below (no matter how far below) the theoretical 55% antenna efficiency line are not a 'problem' to the test team. That's why tests are run; to help manufacturers spot, and hopefully correct, 'low readings.' Antennas that run markedly **above** the theoretical (55% efficiency) performance line are quite another story; it shows that somebody has either done their homework well, or they have been very lucky!

After the Omaha tests, some manufacturers were willing to release (privately) their own test results; others did not. Remember, in Fort Worth, fewer than half of the total antennas that signed up for testing were actually tested. Old man weather simply did not cooperate!

COMING UP / SPACE SHOW

The argument has been made that a national trade association should be the operating agency conducting 'the' national trade show. SPACE is promoting the forthcoming Omaha show as a 'dealer show.' SPACE member firms are being asked to encourage their own dealers to attend. The show, ostensibly, will **not** be open to 'the public.' However, those who are interested in becoming dealers will be invited to attend.

The dates are August 5-6 and 7; a Thursday, Friday and Saturday. The location is the Omaha (Butch Harper) Holiday Inn; a location 'pioneered' by the Rick Schneringer SPTS show of this past summer. About the show, SPACE says:

- 1) Goal One: "To make the convention as meaningful as possible to manufacturers and distributors, to the dealer and pioneer 'members' of SPACE, and, to all members of SPACE."
- 2) Goal Two: "To maximize attendance which will (it is hoped) improve the SPACE financial position, thereby allowing SPACE to become more active in pursuing new endeavors on behalf of the industry, and, to increase membership in SPACE."

"To accomplish these goals, the convention will be geared to existing equipment dealers and to those just becoming dealers, provide meaningful learning experiences, and provide manufacturers and dealers with a thorough understanding of the complex legal issues facing the industry."

To attempt to improve the 'learning conditions' SPACE intends to run the show so that there are no 'over-lapping seminars.' The trade association will provide a certificate of completion for attending groups of sessions; a mini 'business-college-learning-course' for the topic at hand; low-cost TVROs. SPACE promises "there will be no 'selling' of companies or products at these seminars; no commercials."

Topics on the program schedule, at this point, include the following:



DIRECTLY IN FRONT — attendees had to thread their way through a sidewalk filled with TVRO antennas, just to get into the front door!

lowing:

- 1) Marketing Techniques
- 2) SMATV ('small' master antenna television, systems)
- 3) Legal — "The why's and wherefores; the do's and the don'ts" of the business
- 4) System and equipment financing
- 5) Teleconferencing as a sales opportunity

Because the SPACE show is designed for SPACE members (at all levels), there are price levels for attendance which favor the SPACE member. General admission to the convention, for example, is \$150. This includes the annual \$35 individual membership in SPACE, so anyone who attends will automatically become a member of SPACE. Those who are part of the SPACE Dealer (membership) program will pay \$50 to attend (they are presently paying \$300 per year to be a SPACE Dealer member). There is also a 'certificate' program. SPACE Pioneer firms (they pay \$300 per month to SPACE) will be issued certificates, which they in turn will re-issue to their dealers, as they select. With a certificate from a SPACE Pioneer, a person can attend for \$100 (a \$50 discount).

Exhibition booth fees are similarly scheduled. The preference goes to SPACE members, and in particular to SPACE Pioneer member firms. Booth space for SPACE is \$500 for Pioneer member firms, \$750 for sustaining member firms, \$1,000 for SPACE Dealer members and \$1500 to non-members. Pioneer member firms have already participated in an early sign-up, booth lottery exercise to select their booths.

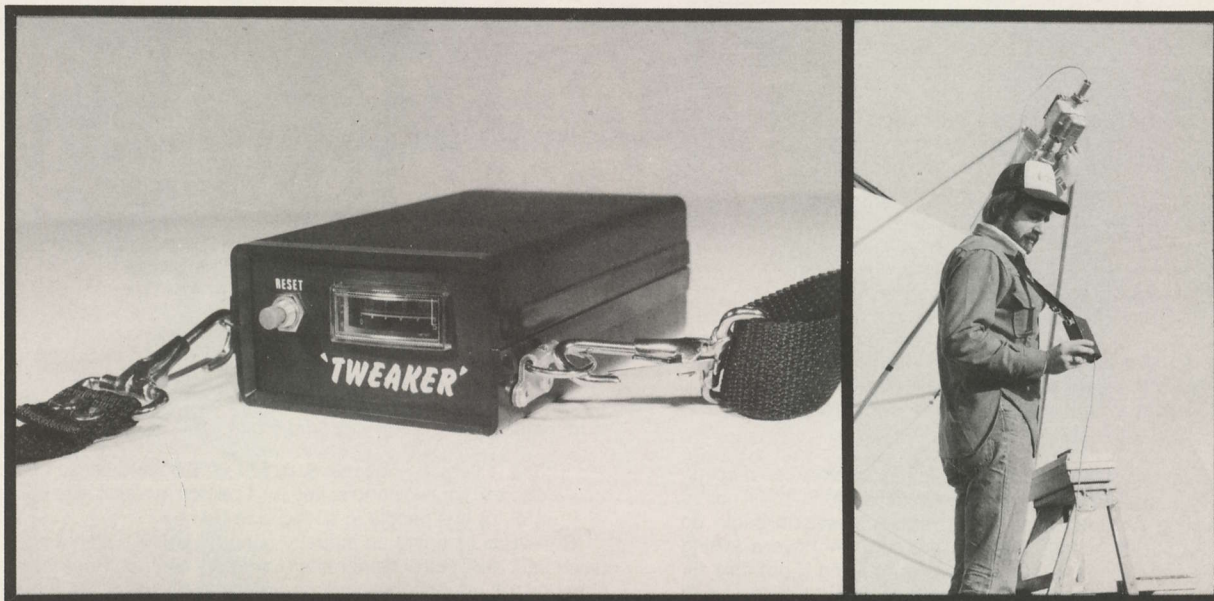
To answer the objection that shows may not provide sufficient 'basic material' for first-timers, SPACE is extending the show to a fourth day for new entrants. For those who so elect, they will be able to come in and start 'industry cram courses' on Wednesday, the 4th of August. This 'extension course' will be designed to provide the



BOB LULY (left) and Jim Wilson, Director of Engineering for Mark IV Fiberglass Industries, announce the winner in a complete-antenna-system given away, by Mark IV.

Q: WHAT IS A 'TWEAKER' ?

A: THE SOLUTION TO YOUR SPARKLE PROBLEMS



Is your antenna system tuned **precisely**? Probably not if you tune it up by watching a TV screen for "least sparkies." However, failure to accurately peak all antennal adjustments will result in a far worse picture than your system is actually capable of receiving. Sound familiar?

What you really need is an inexpensive, fast way to electronically optimize your system — a way to put some "eyes" on the signal and find out what is really going on.

INTRODUCING THE SATLAB 'TWEAKER'

— the professional tool for finding satellites, peaking LNA polarity, and maximizing antenna adjustments. Use it indoors at the receiver or out at the downconverter. Two models available: Model A utilizes the AGC meter output found on many receiver/downconverters (mini plugs and clip leads standard), while Model B inserts directly into the 70 mhz RF line at either receiver or downconverter end ("F" connectors standard). Both models feature pushbutton meter centering and enough sensitivity to actually "see" atmospheric changes and satellite variability. Deluxe neck strap, 10 feet of cable, and pamphlet, "How To Get The Most Out Of Your Satellite Antenna" included.

Finally you can "tweak out" all that sparkle. No satellite is complete without a without a

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A SCENE repeated dozens of times — the hanging of the feed and LNA. Yes, there was a considerable amount of 'cross talk' between adjacent antennas with single conversion receivers!

technical-parameter-basics of a terminal to new or would be dealers. There will be no extra charge for this series of sessions. It will not be open to existing dealers. Then when regular sessions begin on Thursday, the 5th of August, the new entrants will have a talking knowledge of the system and how it works, making it possible for them to better grasp the more detailed sessions that follow as a part of the regular program.

Registration forms for the **SPACE Trade Show** are available directly from SPACE. Write for your set; SPACE, 1920 N Street NW (Suite 510), Washington, DC 20036. There are two other options; **CSD** will provide a form in our **June** issue, or, you may simply address a letter as follows:

- 1) Enclose two checks; one for \$60 made out to Holiday Inn, the other for the applicable amount for attendance, made out to SPACE. The \$60 check is for a deposit on your room at the Holiday Inn.
- 2) Send the checks and a letter requesting a reservation and registration to: SPACE, c/o Holiday Inn, 3321 S. 72nd Street, Omaha, Ne 68124. Holiday Inn will confirm your reservation in writing, directly to you. Be sure to indicate the day you will arrive (August 4, or, August 5 typically). Also be sure to indicate the room type you wish. Rates are \$39 for a single double



ANTENNA ASSEMBLY was the name of the game. The largest turn out of TVRO antennas (more than 70 in all!) jammed in front of the Fort Worth facility, overflowed into the front courtyard, and inside the building.

bed, 1 person, 2 people \$46; \$44 for 2 double beds, 1 person and \$51 for two people; \$49 for 1 person in a king size bed and \$56 for two people in a king size bed.

SPACE is planning an industry banquet and a suitable speaker (such as a member of Congress; Honorable Charles Rose has indicated he will attend); there will be an extra charge for the (optional) attendance of the banquet.

What is happening here is that SPACE is trying to put together a show that does two important things:

Number one — the show hopes to establish SPACE as a 'core group' for the industry, with greatly increased participation in the organization (and therefore the industry) at all levels.

Number two — SPACE wants to increase the exchange of information between participants in the industry. Using the cable industry as a role-model, SPACE feels that there are many-many talented people working in the industry who could, given the proper forum, share their experiences and talents with those who are just starting out. By building on an industry platform of mutual exchange and mutual assistance, SPACE feels the industry will grow and profit.

You can discuss your own needs regarding the SPACE Trade Show by contacting any of the SPACE staff at (202) 887-0605.

INDUSTRY AT LARGE

CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

CSD provides this industry Forum with the understanding that opinions, thoughts and "facts" published are from the writers; no liability for statements extends to the publishers. Address letters to CSD / Industry, P. O. Box 100858, Ft. Lauderdale, FL 33310.

OWN THE FREQUENCY?

I have been reading **CSD** for a couple of years, and enjoy the effort put into it. We were talking the other day about the HBO scrambling plans, and took note that HBO claims they will spend between \$1,000 and \$1,500 for their decoders. This seems to us as if they are putting out far less money for the units than they could take in, if they were to

accept payments from us. Has anyone pointed out that cable only reaches about 25% of the people, and it uses 500 MHz of spectrum space (on F3R)? As I read the FCC rules, it comes across to me that the frequency spectrum belongs to the people; all of the people. Any part of the spectrum should be available to all of the people. And that includes the 500 MHz set aside for the present satellite service. I

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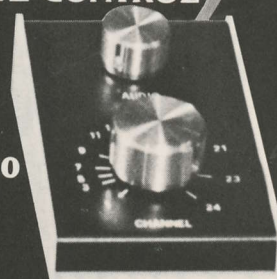
4. Scan tune. . .Automatically sweeps the satellite transponder band for signal detection.

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Also available: KLM SR-3 receivers, KLM Sky Eye II receivers, KLM Moto-trak units, LNAs, 12 ft. solid aluminum dishes, 16 ft. screened dishes.

Call or write for prices and quantity discounts

MICROCEPT

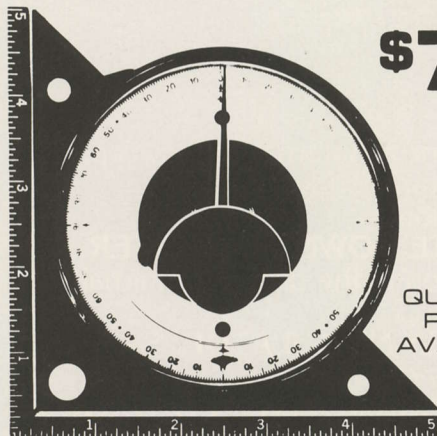
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happen to operate a radio common carrier business. We are required, by regulations, to provide our service to anyone who wishes the service, and who has the tariff-filed money charged for the service. When we run out of time left to 'sell,' we are then able to request additional space in the spectrum. How does HBO get off telling us that they can refuse service to us, when we are willing to pay? Are they not a common carrier also?

Dennis Dal Santo
Dal Santo Communications, Inc.
Green Bay, WI. 54303

Good points. The FCC licenses each satellite operator (i.e. RCA, Western Union) as a 'common carrier.' The common carrier rules, now under attack by the programming industry and the satellite operators, do proscribe that if there is spectrum or time in the spectrum left, unsold, that this time must be sold to the first 'qualified' applicant who shows up. To be qualified, you have to be able to make payment for the time you are buying, and the time rates are established under something called tariffs. A tariff is a formal schedule of charges, prepared by the common carrier, and on file at the FCC. In theory, the FCC can accept or reject tariffs filed with them. Every now and again (mostly again) the FCC slaps the telephone company wrists by denying them approval of some new tariff. Usually, however, the Commission rubber stamps the tariffs filed for approval. Now, if the satellite operator (i.e. RCA) is a common carrier, does that say HBO is also a common carrier? It could go either way. It turns out that HBO is not a common carrier; by (their own) design. They, like Showtime, The Movie Channel and most of the other cable-only services (i.e. WGN, WOR, WTBS are also broadcast services) are not common carriers. They are private firms, renting time and spectrum, from an FCC licensed common carrier; RCA in this case. So we cannot demand, under common carrier rules, that HBO (or others in the same boat) 'sell' us service. Not under present common carrier rules. The FCC is revisiting the whole common carrier/transponder leasing/spectrum utilization question. They have questioned the right of RCA and Western Union and Hughes to 'sell' transponders; the so-called 'condo approach.' Opponents of transponder selling maintain that if RCA sells a transponder, it is no longer the common carrier for that transponder. It cannot 'common-carry' something which it no longer owns. RCA (et al) retort that they are only selling a transponder, not 'shares' in the satellite. That they would, indeed, control the transponder since they could, if push came to shove, turn off the transponder. And they continue to 'own' the satellite super structure, including the powering system. The FCC is not sure what to do in this matter. RCA et al want to sell off transponders for big, up front, advance cash payments, so as to finance their own activities. They have apparently determined that they cannot collect advance 'rents,' for a seven year or longer period; but that they might get away with advance 'sales.' If the FCC finally does accept the RCA arguments, and they allow transponder 'sales' (as opposed to rentals), there will still remain another question to be answered. Does a transponder buyer, then, have to position himself as a 'common carrier'? If the answer is yes, and HBO happens to become one of those transponder-sale-owners, then (maybe) we can take them to court or the FCC by trying to apply common carrier rules. Which state, as you said, that a common carrier cannot refuse service to anyone who is willing to pay the tariff-filed rate.

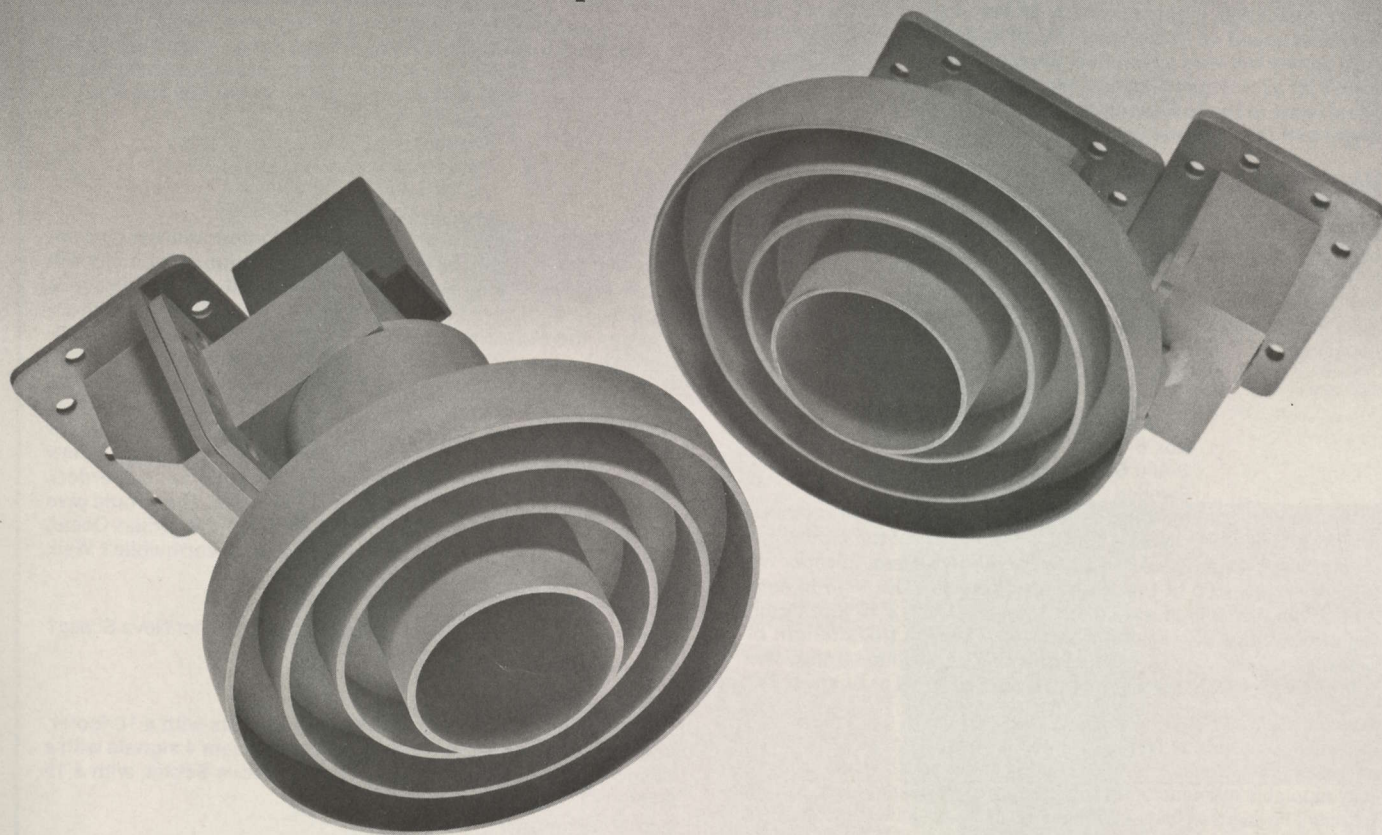
SMALLER THAN 10 FEET?

Cannot a satellite antenna for home reception be made smaller than ten feet in diameter? I was hoping that one could be made small enough to fit on the TV mast on my roof. In the Satellite TV Handbook there is a mention of a Heathkit system. Can you tell me more about this?

Horace Addison
Norfolk, Va.
23509

Ten foot is not magic. It just happens to be the minimum practical size that works well enough to give you excellent reception on the more popular satellites. You could use a 9 foot, or an 8 foot. And still get watchable pictures. On a couple of the hotter

Two New Products from Chaparral:



POLAROTOR™ DUAL FEED II™

POLAROTOR™

Change Polarization without a Rotor, and with Performance that Equals the Chaparral Super Feed™.

With the Chaparral Polarotor™, antenna polarity can be changed in less than half a second. Inside the circular waveguide of the Polarotor™, a probe is rotated by a small servo to any position over 180 degrees with one-degree accuracy. The feed and the LNA remain fixed. Only the probe moves.

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transponders (such as 3, 7, 11, 15 and 19 on F3R) you might even watch what you would get on a six foot. The Heathkit system is less of a kit than it is an assembly project. Sort of like putting together an elaborate child's jungle-gym. But, it is not an inexpensive package, listing for nearly \$7,000. A good portion of that cost is wrapped up in the Scientific Atlanta electronics, which is high quality but very expensive. We read into your letter a desire to do it for a minimum of bucks. We suggest you look into the new (May) issue of Radio Electronics Magazine which carries a build-it-yourself (kit) receiver project by Sat-Tec's John Ramsey.

MAIL ORDER SATELLITES?

Our company is marketing electronic products directly to customers via mail order, throughout Europe. We are interested in expanding our assortment of electronic goods to include a complete satellite home reception terminal. We are interested in being placed in contact with firms that manufacture this equipment, who would be willing to have a distributor in Sweden. There is intense interest here in such reception.

Kjell T. Landin
Director
Overseas Trading
Box 6
S-660 60 Molkorn
Sweden

OK—everyone that thinks they want to expand their distribution to Europe, drop a note to Kjell. Reception of the Ghorizont transmissions has attracted a great deal of press in Europe. We talked with a chap at the NSOC '82, from the UK, who is convinced his firm will market a minimum of 1,000 12-15 foot terminals to wealthy UK residents this year, just on the strength of Ghorizont! Gad ... UK television must be frightful if they are willing to spend big bucks to get a single channel of Russian TV!

SOMEONE LOOKING

You have been mentioned throughout several conversations dealing with the TVRO industry. We would like to ask your help in locating a very reputable manufacturing firm producing TVRO products, so that we might be licensed to manufacture the same or similar equipment in the United Kingdom. Our firm is already established in the manufacturing field and we are working with the government of Great Britain to establish a new, high technology facility. Our contact there is knowledgeable in electronics but admits to limited contact with the TVRO industry. I have been asked to contact you regarding this project. Any help would be greatly appreciated.

Chris Persing
President
C & P Sirch Inc.

This letter reflects a considerable increase in inquiries over the past two months, from firms with a desire to enter the TVRO hardware business in Europe. We felt that readers should be aware that because of the lead which North American (Canadian and U.S.) firms have in this field, there are more and more contacts being made from Europe seeking assistance in getting

started in the manufacture of hardware. The marketplace is no longer hemispheric in scope!

TVRO IN HONG KONG?

We have a large communications and radio-telephone project presently underway from Hong Kong to Singapore. We are interested in knowing if we can set up a TVRO in Hong Kong using a 12 to 15 foot dish, a 100 degree LNA, and a good quality double conversion receiver. The TV standards in that part of the world are 625 line PAL.

Lewis E. Brown
President
Clairemont Industries, Inc.
7573 Convoct Ct.
San Diego, Ca. 92111

No problem putting in such an installation. Watching something with it is another matter! The best programming choices will be on Palapa, the Indonesian bird. Presently, it is offering a couple of Indonesian TV channels (not very entertaining!), a channel from the Phillipines (semi-entertaining), and a recently activated U.S. programmed, English language "premium channel." The service contours into Hong Kong or Singapore would be just a tad marginal with a 15 footer, although a 20 footer might play very well there. And, with a 20 footer and a receiver designed for switching 1/2 and full transponder service (such as the new AVCOM designed for that purpose, available on special order), you would also be in the Intelsat business there. That would give you another half dozen or so channels from the Indian Ocean Intelsat bird family. Can it be done? Yes. It is worthwhile? Well, that's your decision!

NOVA SCOTIA

Will you please tell me what size antenna I need for Nova Scotia?

Philip S. Harnich
Mill Cove
Nova Scotia, Canada

You would get good quality ANIK B signals with a 10 footer, good quality ANIK 2/3 and Westar 4 and Satcom 4 signals with a 12 footer, and the best of all worlds, for Nova Scotia, with a 15 footer.

HOT FEED HORN

We at Earth Stations, Inc. in Windom, Minnesota put a metal coated plastic feedhorn on an antenna, here, in November. In about two weeks time, the plastic feed melted! And this was in our winter period; what would happen when it gets really hot?

Earth Stations, Inc.
Windom, Mn. 56101

Everything has a melting point. A plastic feed horn should not melt simply because it is in the sunlight. If plastic had that low a melting point, universally, we'd see Corvettes dripping all over the world! If your reflector surface is not dispersing the sunlight properly, some sun-heat will get reflected back towards the feed. However, the only time of year even that would be a problem is during the fall, and spring, equinoxes; when the sun and the bird(s) align, and the sun's rays are reflected directly back to the feed or dish focal point. Any dish has to have a flat surface that does not enhance sunlight captured by the dish. There are special, light scattering paints available; usually in the \$80 to \$300 per gallon range (ouch). We found some years ago that good-old Sears Outdoor flat-white latex does everything you need done, for a fraction of the cost. And it will outlast the expensive stuff by a factor of two to one, if it is applied to a 'clean' surface (assuming there is a primer in place). All of this aside, there can be another problem with metal-coated, plastic feed horns. Contrary to popular belief, microwave signals do not travel totally along the surface of a conductor. They do drop below the surface (the distance is microscopic, but it can be measured with the proper equipment). If the metal coating is improperly applied (not even enough, not thick enough, not the right kind of metal, etc.) you can have a feedhorn that simply does not play properly. We saw some test results of a group of such horns, and several 'failed' for coating reasons; displaying a dB or more of signal 'loss' over their all metal counterparts. Like so many things in life, the metal coated horn is not a bad idea. But it has to be done properly, or it won't function

GENUINE HOWARD TERMINAL PC CARDS

Bob Coleman and Tay Howard are now producing six PC cards which make duplication of the Howard Terminal (latest version) a snap!

- (A) Dual Conversion (4 GHz to 70 MHz) - \$25.00
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- Accurate, high gain 11 ft. diameter parabolic reflector
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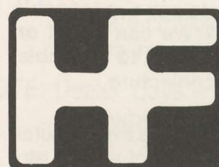
Dexcel DXP-1100-01 (120° K) -02 (100° K)

- LNA/Downconverter (LNC) is housed in a one piece, cast sealed unit with integral waveguide feed horn mounting flange. This extremely cost effective and reliable design approach enables your installers to put the system up fast.
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COMTECH 550 ... Call for prices

like the more expensive part it replaces.

LEAVING ON VCR MACHINES

Several of our customers have VCRs in their homes and there is some concern about using the RF modulator in the VCR for viewing the dish signals. In order to use the modulator, the VCR has to be left on. We would like to know if this causes excess wear when it is left on all day. Is it better to use a separate RF modulator with a satellite receiver?

Christopher Walczak
Applied Space Technology
Elma, New York 14059

We are not familiar with any VCRs in modern manufacture that allow any of their mechanical parts (i.e. recording/playback heads, belts, drives, etc.) to run or move or operate when the VCR is simply 'turned on,' without a tape inserted. We are familiar with some that will not allow you to loop TVRO video and audio into, and through, the VCR modulator unless a tape is inserted into the machine, and the pause control is pushed. If the VCR simply sits there, 'on,' with nothing moving or trying to move in the VCR portion, your only concern is with heat build up. If you stack up equipment, make sure that the VCR does not get heated from below, or have restricted ventilation above, behind, or to the sides. Heat is bad news for anything electronic. We run a number of VCR machines full time (i.e. never turn them off) in an environment that is most severe than most. A slightly heated VCR container will help drive out corrosive air that can stagnate in the VCR container if the unit simply sits quiet all of the time. We have found VCRs that sit, totally off, require head cleaning about twice as often, as those that stay on full time; when both have about the same amount of daily use, or, the unit left on has even greater use than the one that sits off much of the time. Should you use a separate modulator? We do it both ways, and have no strong observations to support either argument, other than those related here.

DELAYED REACTION

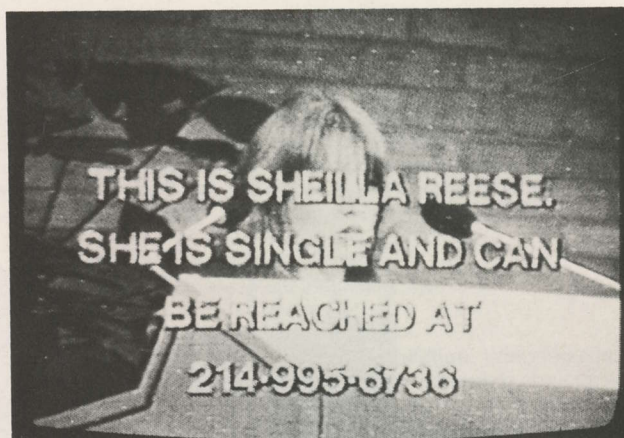
I am writing because I read in our local newspaper where the cable television industry held a conference in our city, and representatives from HBO and Showtime discussed that their companies are now working on systems to begin scrambling of their satellite programming. Other cable firms attending, such as ESPN and The Movie Channel, expressed a 'keen interest' in HBO's leadership in this area, and intend to follow suit in whatever HBO originates in the scrambling area. Please supply information as to how a private, home terminal viewer such as myself, can counteract such an effort. How many channels might be eliminated from our home reception, if this happens?

Pedro Zuniga
San Antonio, Texas
78223

We discussed the HBO scrambling plans at some length in the April issue of CSD. Your local newspaper report was somewhat erroneous; there is far less than universal support for HBO's "leadership" in this area. Showtime jumped onto, and off of, the scrambling bandwagon in one swift motion. The Movie Channel folks have come out as disappointed in both the timing and the technical approach of HBO's scrambling effort. ESPN, meanwhile, is moving more and more towards the traditional U.S. television network profile, having recently begun the practice of offering money compensation to some affiliates; in effect allowing them to 'share' in its now considerable advertising revenues. HBO should scramble, if they are really concerned about security. But, they should also either offer, or be forced to offer, their service to anyone who is willing to pay a reasonable fee. How many channels might scramble? We can count on HBO's pair of transponders on F3R (TR13 and 24) to scramble. Beyond that, who might join them is pure conjecture.

EXTRA NATURAL?

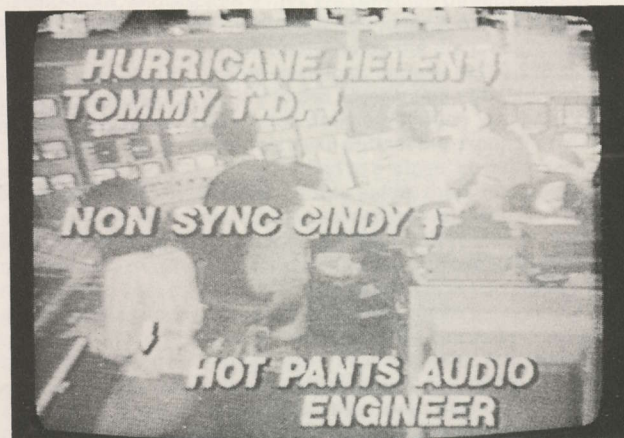
It's not very often that you come across a guy that's extra natural. In my book, your approach to the honest problems of the industry make you tops in this department. I have a pair of short questions. Whatever become of the 'black box' boys mentioned in CSD for July of



1981? Was this another 'fly-by-night' effort, or was it the real thing? Finally, I recently read an advertisement for a business seminar being held in the Cayman Islands. It seems to be near where the Coopers live; are the Cayman's really a Shangri-La on earth, financially as well as heavenly?

Ray A. Graham, Jr.
Delray Beach, Fl. 33444

Short answer first. We have never been to Cayman. People who have moved to the Turks and Caicos, from Cayman, tell me that the development phase of Cayman may have peaked out. Big buck people are moving in, and business opportunities are becoming more limited weekly as the islands mature very rapidly. Cayman does have an attractive set of banking laws and for some time it has been described as the 'Switzerland' of the western hemisphere, vis-a-vis banking laws. One of the hottest new businesses in Grand Cayman right now is home TVRO installations. With the activation of F3R and W4, folks down there are getting very decent signals on antennas down to the 12 foot class. One distributor told us he had shipped 48 complete TVRO systems to Grand Cayman in a 30 day period, this past March. Now as to the 'black box boys.' We have to report that the developer of the system, Keith Anderson of Anderson Scientific in Blackhawk, S.D., has now reworked his contract with SatFinder, and both SatFinder and Anderson are now free to independently develop and manufacture the system. The SatFinder effort has been held up by the delayed arrival, in the states, of English TVRO engineer Steve Birkill. We reported Birkill was about to arrive in the states a couple of months ago; at this writing, UK paperwork snafus still have Steve and family lodged in Sheffield. Anderson, meanwhile, seems to have formed a business relationship with Orbit I Satellite Systems (411 So. Marian Road, Hastings, Ne. 68901; 402/463-0292). They recently introduced



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DATE

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Mail To: **Satellite Services Bureau.**
Northeastern Exhibit
P.O. Box 482
Putnam, CT 06260

Dealer

- ☐ Gate charge: \$35 per day (May 27 & 28)
(\$25 per day if pre-registered by April 1)
- ☐ Four days \$50

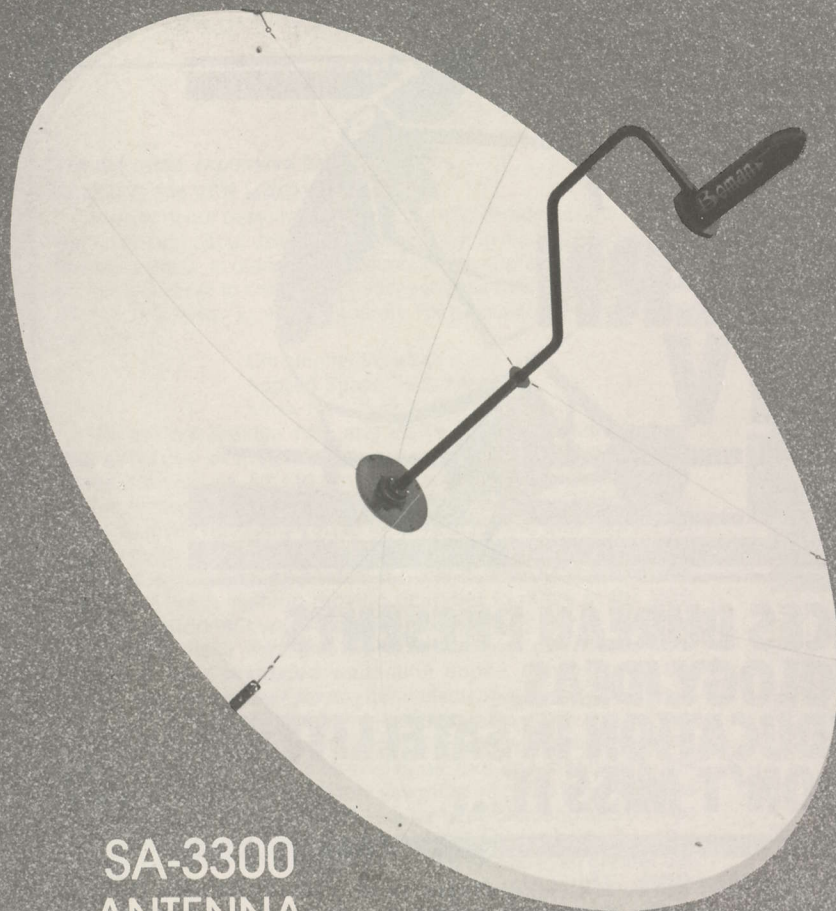
Consumer (May 29 & 30)

- ☐ Gate charge: \$10 per day
- ☐ Pre-registration: \$5 per day

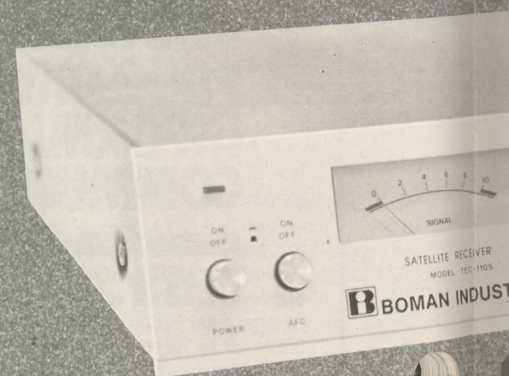
NOTE: Dealer Days - Thursday & Friday, May 27 & 28 - wholesale equipment pricing.

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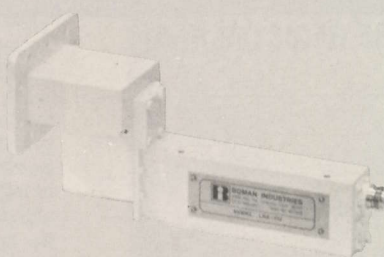
COMPONENTS

RECEIVERS

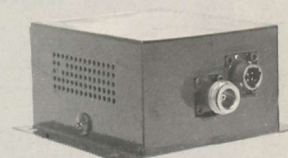


SR-900

LNA-912



DOWN CONVERTERS

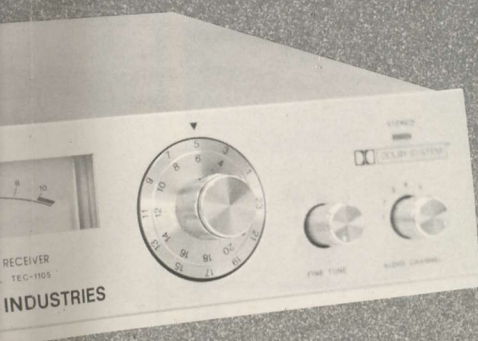


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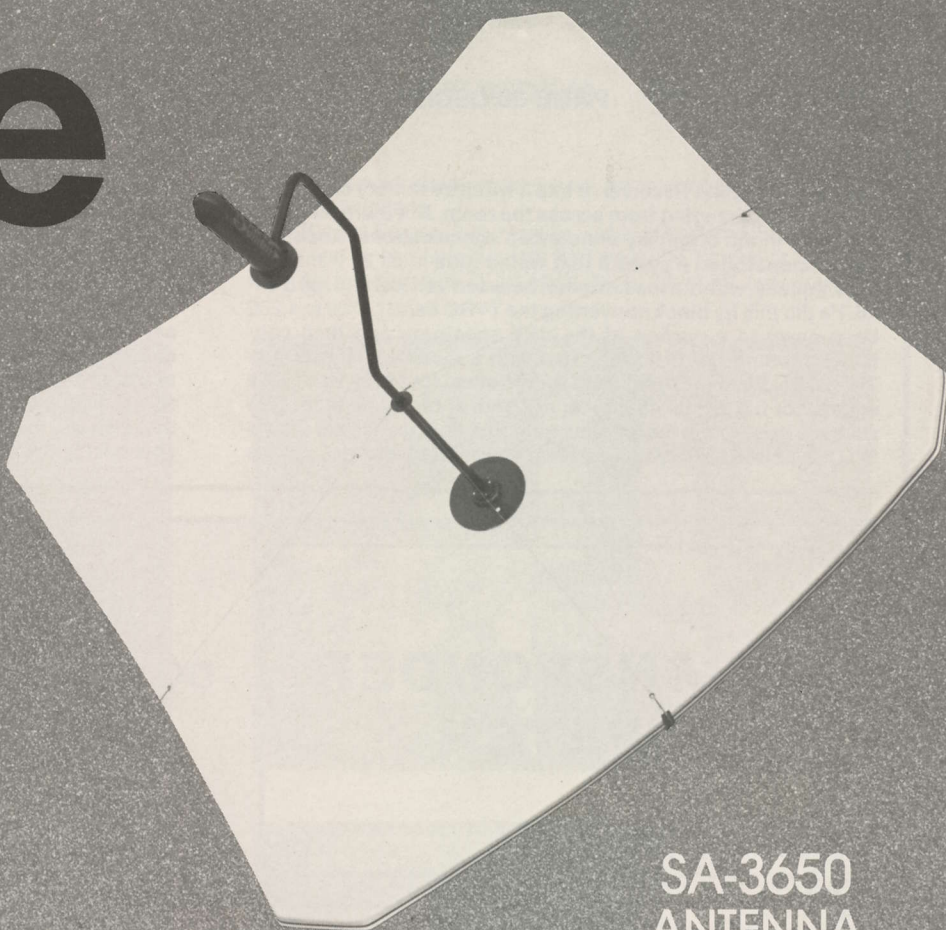
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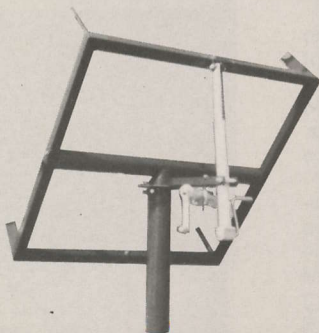
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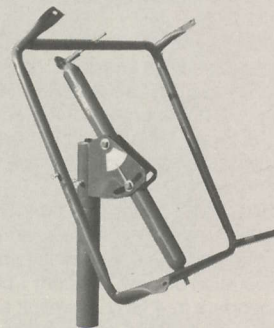
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their ST29 Satellite Receiver. It has a wireless remote control for transponder changing from across the room. But there has been a change in the originally announced specifications. Anderson first demonstrated a system that would tune in all 24 transponders, equally, without feed rotation between vertical and horizontal. He did this by block converting the TVRO band (3,700 to 4,200 MHz) down to a portion of the UHF spectrum, and then continuous-tuning the UHF spectrum with a modified TV receiver. The ST29 package from Orbit 1, however, tunes in either the vertical, or horizontal channels; not both at the same time. This package does retain the antenna mounted downconverter (model SC4) which allows you to string lower cost coaxial cables

throughout the neighborhood, so many homes can plug into the same antenna simultaneously. Inside each home, the ST29 package allows the viewers to select from any of the 12 horizontal (or vertical) transponders, independently of other homes. But the whole neighborhood must agree to use either the horizontal, or vertical, transponders at the same time. Our latest data doesn't say so, but it would appear that you could, given this package, run two separate low cost coaxial cable runs throughout the neighborhood; one for vertical transponders, and one for horizontal, with a duplicated SC4 downconverter at the feed. As for the ultimate, tune any of 24 transponders, system, at a reasonable cost . . . we are still waiting.

TRANSPONDER WATCH

RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P. O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

RCA, one of numerous applicants for a 12 GHz DBS satellite program, is also openly discussing the manufacture and sale of a home TVRO. The new package, now being designed, has a target price in the \$500 range; will operate at 12 GHz.

INTERCONNECTION of more than 800 banks plus a credit card processing center in South Dakota is planned by Citibank Corp which has acquired rights to two full transponders on Westar 5.

LAUNCH SCHEDULES of interest: June 12th / Westar 5 (likely to be operational by third week in July); August 12th / ANIK D1 (operation not expected before late November); September 30th, or, November 18th / SATCOM F5 (45 day turn around before operation begins); March 3 ('83) / SATCOM F6; June 9th ('83) Galaxy 1 (likely operation mid to late July '83); July 28th ('83) / Telstar 3A; September 15th ('83) / Galaxy 2; December 19th ('83) / RCA F7.

IN THOSE launches, Westar 5 will replace Westar 2 at 123 west; Satcom F5 will be newly located at 139 west; Satcom F6 will be newly located at 143 west; Galaxy 1 will replace F1 at 135 west; Telstar 3A will replace Comstar D2/3 at 95 west; Galaxy 2 will be newly located at 79 west; and, Satcom F7 will replace F2 at 119 west.

ALL NEW Weather Channel, 24 hour per day all-weather service, scheduled to kick off coincidental with NCTA annual convention May 2; transponder 21 of F3R.

ALL COMMENTS are in, to FCC, on Commission proposal to tighten up satellite to satellite spacings. 35 firms filed, most were not in favor of 2 degree spacing. Several favored 3 degrees, AT&T said it would go along with 2.5 degrees. COMSAT, and others, suggested flexible spacing allowing for operation of adjacent satellite formats. Trend in filings was for compromise; blanket approval of 2 degree spacing seems not likely.

SYMPHONIE 1 and 2 birds, now co-located at 11.5 west (nominal; they move as much as ± 1 degree from this location in figure '8' pattern), will try to stretch their service time until late '83/early 84 launch of, and operation of, new Telecom 1 bird. The new satellite will have four transponders in 4 GHz downlink service plus six in the 12 GHz downlink region. Military communications in 7 GHz downlink region will also be on board.

CBN's 6.3 (6.48 MHz stereo) music service will terminate on F3R transponder 8 by mid-June. Approximately a dozen radio stations have taken the service; not enough to allow CBN to maintain the operation.

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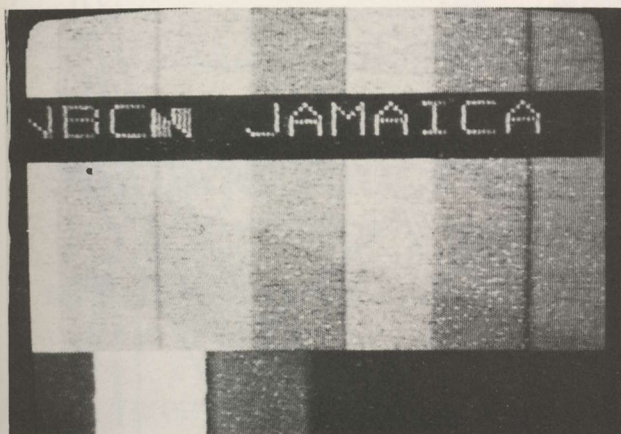
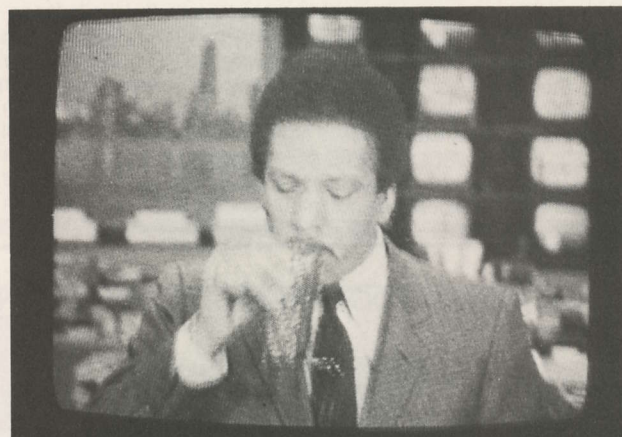
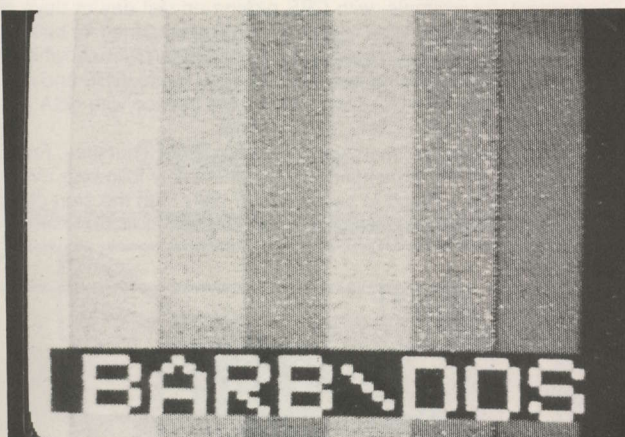
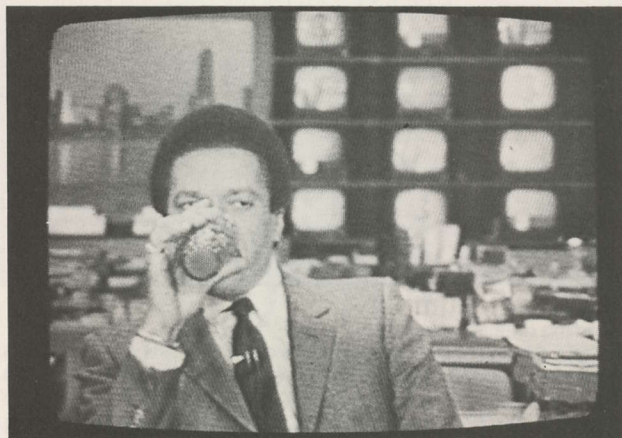
ROLLING

SATCOM F4 transponder 18, leased by HBO, is on occasions sub-let to others. Sporting events transmitted under contract can be found there from time to time.

FCC officials are predicting first approvals for 12 GHz DBS will come before summer is over. STC repeats that it will not have its own

getting into field, claiming they have no interest in manufacturing hardware long term.

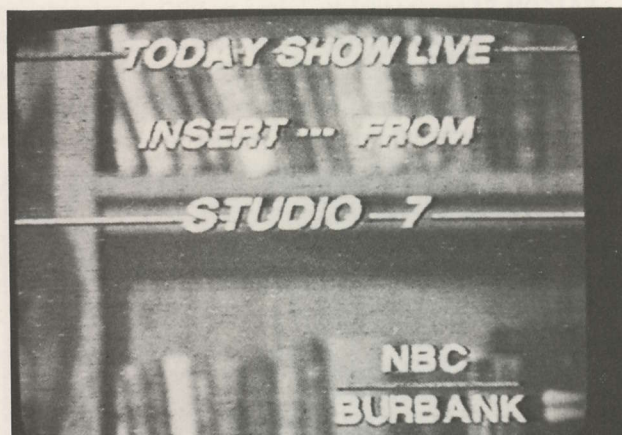
DBS from Europe, that might be visible in eastern USA, is plan of British firm United Satellite, Ltd. Bird would be located at **31 west**, have six transponders in 12 GHz range, of which two would be



dedicated satellites in operation for service until at least three years after FCC approval. Meanwhile, Comsat's STC has set July 15th as deadline for firms planning to submit proposals to it (to provide home-type 12 GHz DBS systems) to have working, proto-type models to them for study. COMSAT says they will initially fund production of receivers just to get field going, but would welcome other suppliers

available for DBS while four would be leased out for business communications.

MAGICABLE will be new service planned by former NBC President and programming whiz Fred Silverman. Silverman has formed alliance with MGM/United Artists, will program service 24 hours per day, offer it as 'basic' service to cable firms, via satellite. No pro-



gramming details announced.

FOLLOWING more than ten years of debate, Canada finally has authorized pay television service. First Choice Canadian will be a French and English 24 hour per day service, primarily Canadian in content. Lively Arts Market Builders, Ltd. will be a 6 hour per day 'cultural' and 'children's service.' Both will be distributed nationwide. Regional service approvals were won by Allarco Broadcasting for Alberta service, with a 50 hour per week schedule; Ontario Independent TV for an Ontario service, also 50 hours per week schedule; Ontario Independent TV for an Ontario service, also 50 hours per week; Star Channels Service with a 47 hour per week schedule for Nova Scotia, and, World View TV for a 92 hour per week British Columbia schedule. Each of these firms must be operational by April of 1983. Some will be distributed via satellite (which ones is not known, yet); others via terrestrial microwave. The six winners were selected out of 28 applicants still in the running at the end of the ten

year debate and study.

ITALIAN SIRIO 2 satellite, scheduled for late April launch on ESA Ariane bird, will not fly until June or July. Problems developed with a second satellite scheduled for same launch, putting off launch date.

SUBTLE changes in USA Network programming (TR9, F3R) may be indication of things to come. USA now has arrangement with CBS which has included USA coverage of early days of Masters Golf Tournament, for example, with CBS picking up last day or days on 'regular' TV. Several similar 'mutual' projects are planned for balance of year. ESPN, all sports service on transponder 7, meanwhile is developing similar scenario with ABC. By year's end, CBS and ABC sporting coverage could well become double service with USA Network and ESPN, respectively, participating.

EROS, new service seen from 11 PM to 2 AM Thursday, Friday and Saturday on W4 transponder 19 (immediately following EWTN sign off), plans to expand to six hours per night with the start of the

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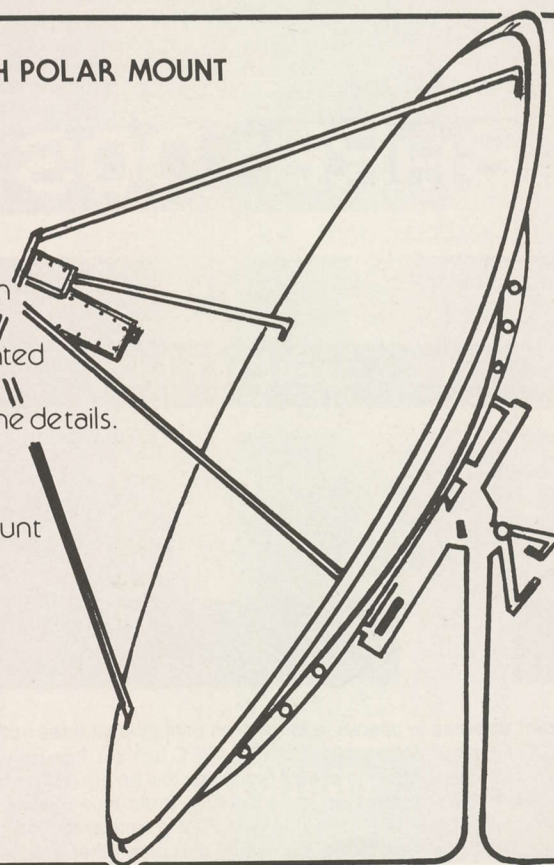
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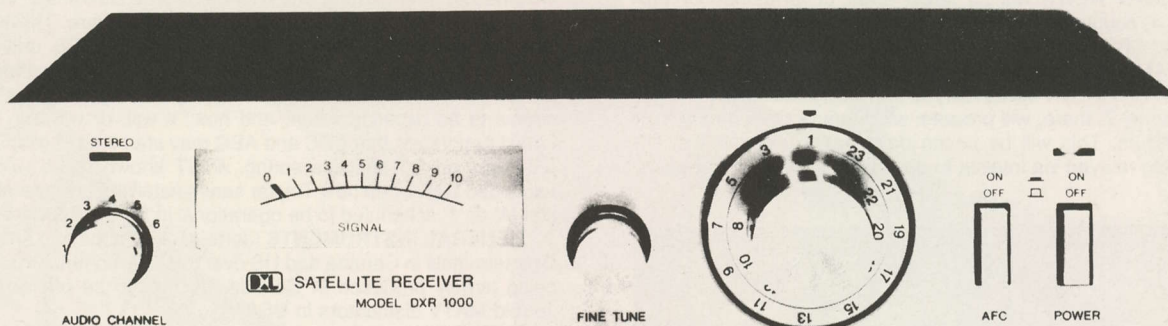
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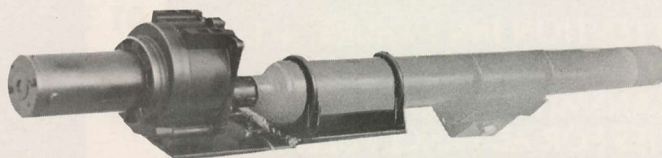
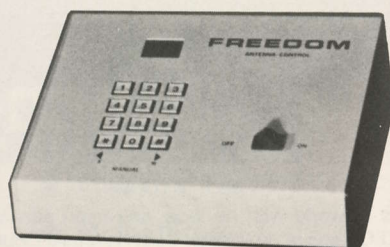
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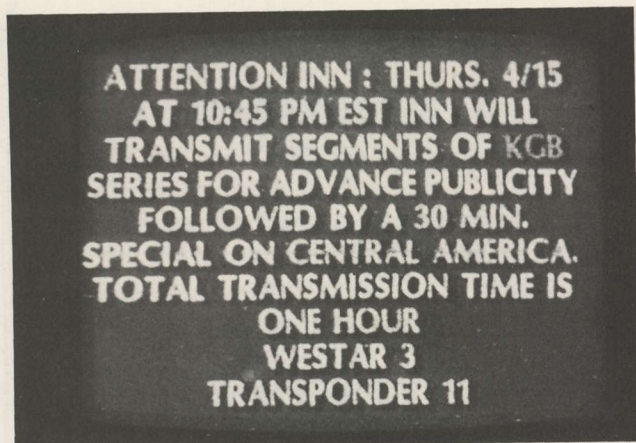
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fall TV season.

INDIAN INSAT-1 bird will be turned over to Indian Department of Space in mid-fall. Bird, launched in April, has dozen 4 GHz transponders plus a pair of 2.6 GHz 'S band' downlink channels; latter two are to be used for direct broadcasting service. Similar 'test' service was provided by experimental NASA ATS bird back in 1975 and 1976. INSAT 1 is at 74 east.

ALL NIGHT NEWS will be latest effort of terrestrial TV programmers. A couple of stations are starting to use CNN for all night service, and CBS has announced it will feed (possibly via satellite) a 2 AM to 5 AM news program this fall. Also, scheduled for January 1 start, Ted Turner's CNN will be relayed via Pacific Intelsat to Australia where Channel 7, there, will program six hours of CNN during their nighttime hours. This will be seven days per week, and first US programming relayed via Intelsat to distant point on a regular basis.



MAY 24th battle between Hearn and Hagler has turned into a pre-fight legal-battle. HBO says it is exclusive distributor of fight; several others, including SelectTV say that is not so. Legal battles will probably last far longer than fight itself.

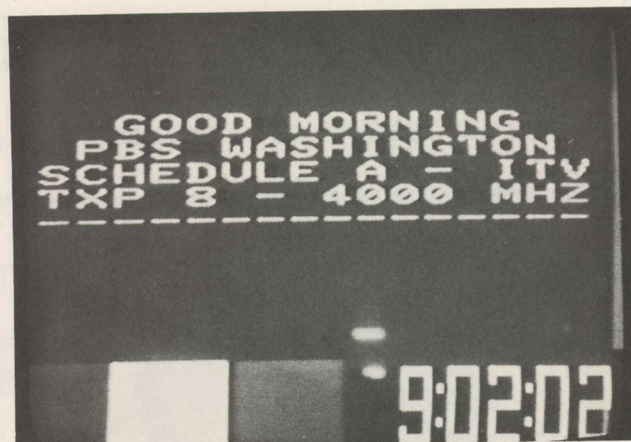
FCC FINALLY decided that RCA could 'sell' seven transponders on F4, for price of \$13M each; price covers 7-3/4 year use of transponders. This opened way for RCA to begin 'loading' process for the largely un-used F4 bird. RCA claims the \$13M rate is based upon 'demand.' Some FCC officials, voting against approval, said RCA was making excess profits from arrangement. Eight prior transponder winners on same bird (those that had signed up for service on interim D1/DF2) got essentially same transponder use term, for \$6.8M. Yes, there will be court appeals by somebody! Do not expect sudden increase in F4 occupants, however. Most of those who would like to be on F4 are looking at fall or winter '82 occupancy. The first new

service likely to pop up there will be either RCA's Entertainment Channel (mid June, transponder 8 now scheduled); or, **perhaps** WOR, if they are shoved off of TR17 on F3R on schedule (now set for July).

NETWORK programming via satellite. What's happening? Other than feeds of news and sporting programs, satellite transmission of daytime or evening (prime time) programming remains up in the air. NBC has an arrangement with AT&T for use of D3 transponder 1, but only a limited amount of programming appears there. This is essentially the same service which NBC carried on F2, TR8, until last fall. The heavy dependency of the networks on AT&T inter-connects has placed an unusual aura over satellite expansion; the 'seller' (AT&T) seems to be dictating when, and how, it will, or will not, happen. Latest rumors are that CBS and ABC may start limited distribution of programs on D3 late this spring. AT&T known to be working on expanded plan when new Telstar series satellites are available (Telstar 'A' or '1' scheduled to be operational in fall of 1983, at 95 west).

GENERAL INSTRUMENTS (Jerrold, et al) hoping to sell 2,000 4 GHz terminals in Canada and US over next 12 months. Products are being largely produced in Canada, but are to be offered through Jerrold MATV distributors in USA.

CAMEROON government, possibly reacting to appearance of first private TVRO terminals there (see CSD for April, 1982) has contracted with COMSAT for 'planning of fully integrated national satellite-delivered TV network.' Reports indicate the African nation will use an Intelsat transponder for program relay. This is one of



larger nations of world with no local television services available.

NEW AUDIO service on Westar 3, TR1; Music Country Network. WSM (Nashville) is originating producer, and programming runs 10 PM to 5 AM in three time zones.

MUTUAL continues battle with Western Union over WU refusal to grant Mutual additional audio-bandwidth on Westar 4, TR3. Mutual claims they moved to total satellite distribution for full network based upon WU promise to make additional channel capacity available. Now Mutual says it needs that capacity for expansion, but WU won't deliver. The W4 TR3 transponder is loaded with FM audio channels spread throughout entire 1 to 8 MHz 'baseband' region. Included in there are 8 National Public Radio channels, a pair for Muzak, 3 held by Mutual and two in sometimes-use by Robert Wold.

IN ANOTHER audio service development, a 24 hour per day 'ABC Superadio' service will begin on W3, TR1 on July 1st. This will be an 'adult stereo contemporary' programmed service, delivered via Wold to more than 400 Associated Press earth terminals.

HARRIS CORPORATION showed new dish controller system at NAB convention; system will handle (Harris) 6.1, 9 and 11 meter antennas, allows remote control of azimuth, elevation and feed polarization. Model number is 9165; details at 217/222-8200.

IF HAVING a telephone in a remote area is worth between \$3,000 and \$7,000 per month to you, check with Western Satellite at 303/771-9200. Firm now offering 'Sat-Phone' up and downlink terminal rentals using SCPC and small (4.5 meter) antennas.

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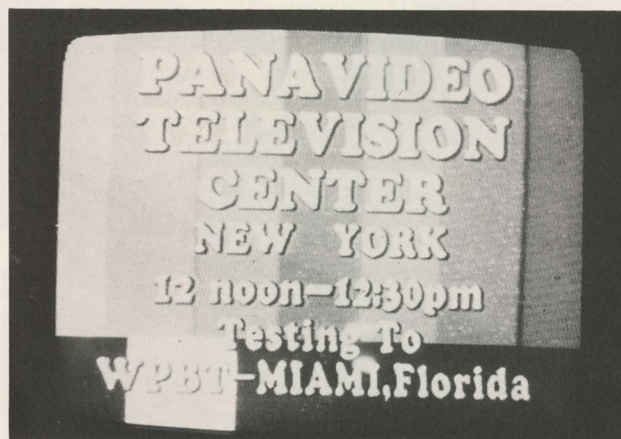
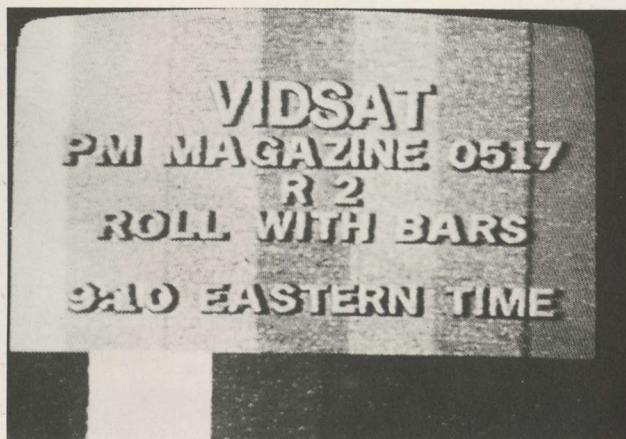
HASTINGS ANTENNA CO., INC.

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AN RCA employee has developed a time-sharing system which allows two terminals to exchange two-way video, with one another, on the same transponder at the same time. They do this by sequencing one on and one off, for fractions of a second each, so the two can 'talk' back and forth with Teleconferencing.

JAPAN says they, too, will have a DBS, pay television, system. But not before 1989. They plan to build own system, and launch it. System will be a pair of channels, initially, with 12 GHz downlinks and dishes in 18 inch class. Subscribers will 'buy' magnetic decoding cards, monthly, which they will insert into their descrambler units. They expect 10,000,000 subscribers shortly after service inaugurates. Prior to the DBS pay television system, Japan will launch BS-2 in the spring of 1984, providing two channels of NHK television to Japan and surrounding areas; following this with 8 channel BS-3 and BS-4 birds.



INTERNATIONAL videoconferencing system proposed by Intercontinental Hotels and Comsat has released proposed charges; about \$1800 per hour for color video and two-way audio.

FIRST use of Shuttle to launch satellites into geostationary/Clarke orbit position will be this November. ANIK C and SBS-3 will be 'tossed out' of the cargo bay.

CONTINUED expansion of Robert Wold and Company. Wold will lease a pair of transponders on D3 for video customers not yet named, starting this summer. Wold will be consolidating transponders on W4 in interim, as follows: fulltime use of transponders 10 and 19 immediately; addition of TR9 on or before July 1, and, TR11 on or before August 1. Wold traffic presently on TR10 will shift to TR18 on August 1, apparently to coincide with the Western Union expected service cut over date for W5.

TVRO designer Nelson Ethier, well known at SPTS gatherings and for his Parabolic Antenna manual for STT, is scheduled to be a part of a Canadian effort to climb Mount Everest in September. Ethier is going along not to climb, but rather to help man-unique live coverage of event on Canadian TV by Teleglobe. Using a small, portable uplink, video coverage will wing out of Nepal back through Intelsat, via another Intelsat, finally to US, where it will go via domestic bird into Canadian TV system.

GORIZONT 5 bird launch announced by Russians in mid-March. Bird apparently was not scheduled for operation on Atlantic path since it has not shown up there. The present Ghorizont bird at nominal 14 west is due for replacement, however.

NASA losing battle to get federal funding for experiments with new 20 GHz down, 30 GHz up satellites. This 'next-up' band (above 12 down, 14 up) is considered the next frontier in space commu-

nications technology. Italians and others, including Japanese, are mounting intensive effort to develop hardware for this band. NASA funds have been badly cut down and officials there are concerned that US may give away technology lead (and future manufacturing of satellites and systems) to balance of world, due to cutbacks.

NATIONAL Microtech will use satellite this month to stage 'show and tell' for dealers nationwide. Reasoning that all distributors and dealers have satellite terminals, and that given advance warning they could tune in 'seminar' and attend without leaving home, NM will pioneer satellite inter-connection to the sales and installation force. Program will uplink from Washington, DC.

SOME of the variety of W4 users seen during the first two weeks.



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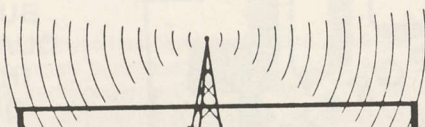
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CONTINUED/from page 3

getting worse. By day to day measurement. And this is with a brand new bird. Think what may happen a few years from now as F3R ages!

I have a suggestion, Ted. I know that you have 14 for CNN and that is yours (thanks to the court decision) for the duration of F3R. You also have temporary use of transponder 15 for CNN-2. Transponder 15 is one of the really healthy transponders. It looks great from coast to coast and border to border. Transponder 14 is, unfortunately, only a shade better than 6; the victim, I suspect, of the way RCA has elected with F3R to soak off some of the transponder power to feed a separate antenna array for Hawaii.

If you are really concerned that WTBS give ABC, CBS and NBC a run for their money, you need to be certain that WTBS looks as good as it can possibly look. You are a poor third to WOR and WGN quality, now, on F3R. The best short term solution would be to swap CNN-2 and WTBS; placing WTBS on transponder 15. A better long-term solution would be to make the 6 for 15 swap with WTBS and CNN-2, now, and then turn around and look for some more efficient transponder for WTBS long haul. Yes, getting off of the 2, 6, 10, 14, 18 and 22 transponder set will cost you Hawaiian coverage, but you stand to lose far more homes covered in the mainland 48 by staying with that 'sick' transponder set on F3R, than you will ever gain by being the only mainland indie available in Hawaii.

There is no quick, simple solution to this problem, Ted. But I urge you to look into it since it will ultimately cost you growth problems. In truth, RCA has gotten to you twice on F3R by apparently building into the bird a transmit antenna error that catches two of your services; WTBS and CNN.

Let's get together and discuss this one day soon. I'll show you my arrows if you will show me yours!"

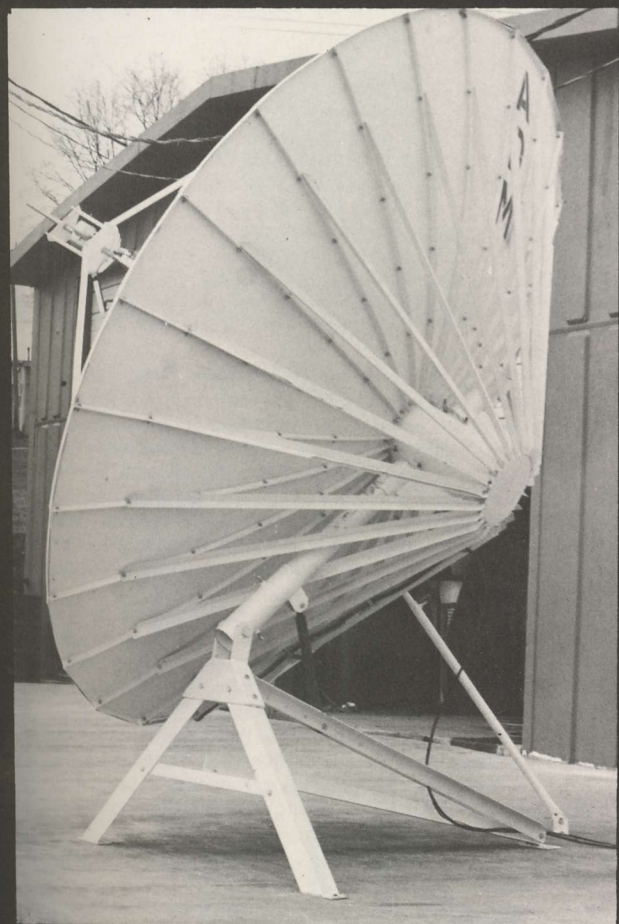
RECEIVER SUIT

Back in 1975, or so, there was but one supplier of satellite receivers; Scientific Atlanta. S/A was there first with packaged systems and they gained an early lead against the only competition; the combined package offered through Andrew (antennas) and a fairly new, upstart firm called Microdyne.

In the ensuing years Microdyne has become a major force in the commercial receiver field, acquiring through stock exchange an antenna firm called Antennas For Communications (AFC). Microdyne learned early that the mid 70s market, cable systems, did not want to buy a receiver here, an LNA there and an antenna at a third location. Virtually all TVRO systems sold, to cable systems, in the 1975 to 1978 era were sold on a 'turnkey,' or, installed-by-seller basis. There was a period in all of this when a war broke out as to which supplier of the parts would be the 'turnkey' installer. Eventually it fell upon the makers of antennas to be the actual turnkey-ers since the antenna was the part which required the majority of the turnkey effort. During that 'war period,' firms such as SCI (Scientific Communications, Inc.) rose and fell to and from prominence, as the market forces gave and took like waves on a storm tossed sea.

There were really only two receivers that made a dent in the marketplace during that era; an S/A unit and a competitive model from Microdyne. Of the two, the Microdyne ended up being used by the largest number of **freelance** turnkey installers since then, as now, dealing with S/A was difficult. In effect it was S/A against the world; "the world" being every other antenna manufacturer. There was a tremendous void here; a shortage of "choice" in the TVRO receiver area. SCI and a handful of others made stabs at filling that void. Years later, the only really effective effort that has endured came from Microwave Associates (M/A COM). Others, such as Hughes, brought out product, but never mounted the intensive marketing efforts necessary to grab a substantial chunk of the marketplace.

Through all of this a new receiver designer had a pair of 'educational' choices. You could tear into the S/A receiver to see what made it tick, or, you could tear into a Microdyne. Most chose the latter since the Microdyne units were more basic in design. S/A, in that era, was really an assembly house, buying outside most of the receiver subsection 'modules,' which eventually would be fitted together in an S/A plant to form a complete receiver. Microdyne had established itself in the satellite video receiver field by selling INTELSAT grade boxes to users worldwide. And most, if indeed not all, of the Microdyne receiver



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package had been designed, and was being assembled, 'in house.'

The buzz word in those days was "threshold extension." TED (or T.E.D.) was that special bit of black magic that made a receiver perform even when the signals were weak; or "below threshold." For those new to the field, threshold is a measurement point in receiver performance. A signal that equals or exceeds "threshold" will, or should, produce a noise or glitch free picture on the screen. A signal that falls below "threshold" will have noise in it. In effect, the "threshold" is the break over point; anything weaker than threshold is bad. Anything stronger is good.

In 1975 or so, just as all of this started, a T.E.D. "drawer" of electronics, sold as a separate package to an existing satellite video receiving terminal, cost as much as \$12,000. That's not a full receiver; just an attachment or 'drawer' of electronics. If that seems unconscionable, consider this.

A T.E.D. 'drawer' added to a receiver had the ability of extending the threshold downward by as much as 3 dB. Which is another way of saying it made the receiver 'think' it was connected to an antenna 3 dB "larger" than it was. A 20 foot became a 30 foot, and so on. In the INTELSAT world, if you were already using a 40 or 60 foot antenna, there was no way you could 'double' the size of the antenna for a 'mere' \$12,000. And you probably couldn't make up that same 3 dB by improving your LNA since most Intelsat installations were, then, using parametric cooled LNAs with noise temperatures in the 80 to 100 degree range. Lowering the noise temperature to absolute zero (K) wouldn't buy you **3 dB** signal improvement, and absolute zero was (and is) beyond reason.

So when S/A came along with their first CATV-grade TVRO receiver, they made some claims for 'threshold extension.' Of all of the black magic art then (and now) found in a TVRO receiver, T.E.D. was the blackest art of all. On close inspection, it became apparent that T.E.D. was a trade off; you could buy improved carrier to noise (CNR) ratios but in doing so, you began to introduce some measurable (perhaps even eye-visible) degradation to the video quality. People usually accepted the video degradation, that went with T.E.D., because they were facing a trade off choice: sparklie noise (degradation), or **slightly** impaired video smearing or ringing. Noise bothers most people more than video smearing (i.e. edges of images losing that 'crisp' look), so T.E.D. was accepted.

S/A and Microdyne, in that period, treated T.E.D. in their instruction manuals by drawing a small square or rectangular box on their elaborate schematic manuals, and marking it "proprietary." In other words, don't ask us what is inside; it is a secret. Asking them about the 'unmarked boxes' brought very nervous responses.

Well, Microdyne got themselves a patent on **parts** of their receiver design. One of the areas Microdyne wanted to 'protect' was their discriminator; that portion of the receiver which turns the IF signal into video. The Microdyne discriminator was, to be sure, quite unique. It was a piece of coaxial cable. Coaxial cable can, indeed, perform the demodulator function, if it is employed properly. It is also an **inexpensive** way to demodulate.

Way back in 1976, a largely forgotten private TVRO pioneer named Cliff Schrock, of Beaverton, Oregon, demonstrated his own home built receiver at a Community Antenna Television Association (CATA) seminar in Oklahoma. Schrock used a coaxial delay line discriminator operating in the 270 MHz region (his chosen receiver IF), to demodulate his video. Schrock was so far ahead of his time that his work, although shown to hundreds at the CATA meeting, was largely forgotten. But not by everybody. A few took home with them notes from that CATA demonstration, and eventually those notebooks became working, prototype circuits.

Whether Schrock obtained his concept by peering inside of a Microdyne 'box,' or figured it out on his own, is not clear. Schrock was, at the time, employed by the folks at Tektronix. His work was in high technology RF and video systems, and he certainly had access to the best test equipment, and technology, of that era.

Recently, Microdyne has decided to press their legal rights to their own patented receiver parts. In doing this, they have mailed out some quantity of letters warning (or threatening) anyone they suspect may be involved in using (or thinking about using) their patented circuits, to

CONTINUED/page 44



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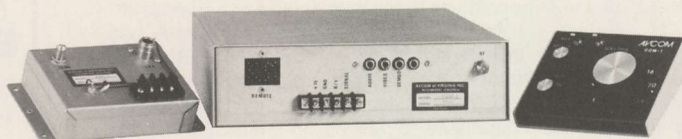
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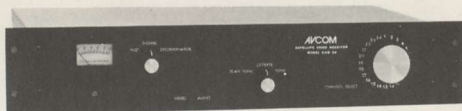
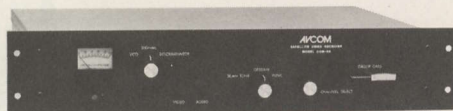
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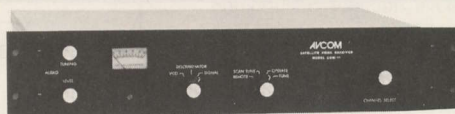
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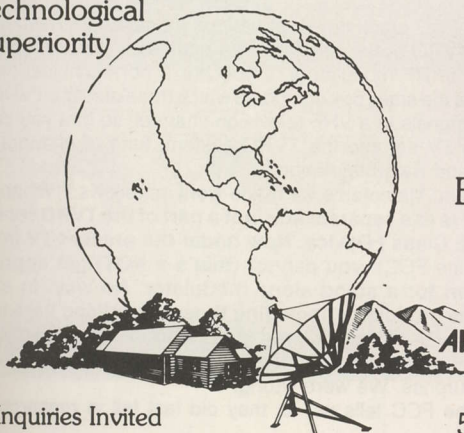
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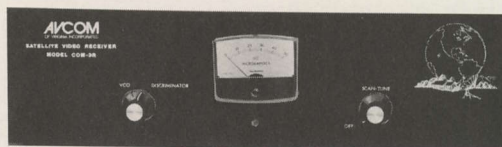
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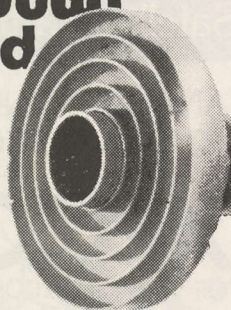
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CONTINUED/from page 40

'lay off.' This is a normal business procedure to follow when you have labored long and hard to develop something unique, and you have gone to the trouble and expense to get patent protection.

One of the recipients of this warning notice was Andy Hatfield of AVCOM. Some months ago, in reviewing the AVCOM receiver in these pages, we wrote that Andy Hatfield was one of the true pioneers in this business. We related how Andy, then working in the computer field, had purchased his first home TVRO system and that his first receiver was a Microdyne receiver. We also noted that Andy had studied the Microdyne design before embarking on his own design work.

From the very beginning of the AVCOM receiver, it has been a top performer. In the early days of home receiver design, virtually every-one who was trying to enter the receiver field had a Microdyne receiver sitting on the work bench. The designer would use the Microdyne as a 'grading' tool; work on his own receiver design, and then do a side by side comparison with the Microdyne. Initially your goal was to get the receiver, you were designing, to produce the same (high) quality picture as the Microdyne unit. If you reached that plateau (few ever did), then your next goal was to make your receiver work better. You could get as good as Microdyne if you were talented and a good copier. You got better-than Microdyne performance by being smarter than Microdyne.

The first receiver I ever owned was a Microdyne. I still have it. It weighs about as much as five to ten of the current receivers, is a nightmare to service, and it does not like Turks and Caicos voltage. I keep it around for sentimental reasons. Every now and again somebody brings or ships down a **current** version Microdyne, or Scientific Atlanta or M/A COM TVRO receiver, and I hook them up and compare their performance to what I have on hand here in daily use. The Earth Terminal receivers walk all over these big buck units, and my current crop of four AVCOMs have an edge on the Earth Terminal units. When I wrote about Andy Hatfield's AVCOM units last fall, I noted this field test observation, and made some comment that Andy had taught himself well what Microdyne learned before him.

But, you don't get better than Microdyne (or S/A or M/A COM) by being a copy cat. You can get as-good-as; but not better than. Microdyne is now accusing several of the home terminal folks of 'lifting' their patented designs. I don't know what is going on in their corporate minds, but I hope they are not so foolish as to think AVCOM or anyone else, using similar receiver designs, got to their present stature in life by copying them. I'm reasonably certain Microdyne does not like reading in **CSD** that their receiver is less sensitive than an AVCOM (or an Earth Terminal unit). They are a proud outfit, and they have paid their industry 'dues.'

I have carefully studied their patent, and their recent 'notices.' I am not an attorney, nor a design engineer. But I **am** something of an industry historian, and I can trace how various pieces of gear got to where they are today. I don't see conflicts which Microdyne could build a patent infringement case upon. And I hope that Microdyne sees it that way also.

ONE OF A KIND?

In our January (1982) issue of **CSD**, we wrote about a perceived threatened FCC crack down on various manufactured segments of the home TVRO system package. In particular, we cited the quicksilver area of RF modulators. If you are a non-technical type, the modulator is the small box or module which translates the TVRO video and audio signals to a VHF television channel; so that you can plug your home TV set into the TVRO system, tune to channel 3 or 4 (typically) and watch television.

One of the statements we made went as follows: "**When (a TV) modulator is in a separate box, not a part of the TVRO receiver, it is clearly a Class I Device. Now under the present TV interface Rules (of the FCC), you cannot (that's a NOT) get approval or certification for a stand alone modulator. No way. In short, a stand alone modulator (including those advertised here in CSD) are, in the eyes of the FCC, not legal. And there is no way, under the existing rules, to make them legal.**"

Well, surprise. We were wrong.

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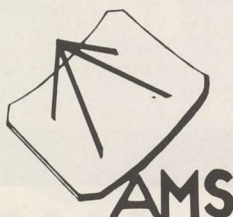
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January report, that they have not and will not accept for certification any stand alone (i.e. separately packaged) TV modulator device. That was the thrust of the January report.

When we wrote that report, we fully recognized that there were many modulators being advertised in **CSD**; that some of the firms offering these stand alone devices might be upset by the report. We were not disappointed. Shortly after the January issue hit the mails, we had two telephone calls from John Cryer of Microwave Consultants / Power Consultants, Inc. John's firm manufactures modulators.

"Hadden't we noticed that the advertising for Microwave / Power modulators stated they were FCC approved?" John wanted to know. Yes, we had noticed that those words appeared in the advertising copy.

"Do you think we made this up?" he asked. We didn't want to admit it, but that is what we thought.

Well, at the NSOC gathering in Fort Worth John came loaded for bear. He had with him two very interesting pieces of paper.

One sheet was an FCC approval for a VHF TV modulator. It was authentic. The second was a support notice of approval of his modulator, by the FCC.

We told John that the Commission claimed no such approvals had been granted. **"You are holding it in your hand"** he retorted. It was early in the show, and our eyesight was still good. We acknowledged what we were holding.

We stand corrected with this observation. The FCC is not a perfect agency. It appears to us that someplace between the policy making group, where the word was out that **no** such approvals would be granted while there was a long, dragged out rule making proceeding underway on this very subject, and, the people who routinely approve (or disapprove) hundreds of pieces of gear submitted for approval/certification, somebody got the messages garbled. **John's firm got an approval**, and to the best of our present knowledge his is the only VHF TV stand alone modulator ever approved by the FCC. There may be others out there, that "snuck through," but we are not aware of them.

To set the record straight; the Power / Microwave Consultants Model 410 RF modulator has FCC approval. If you are concerned about buying and using a modulator which satisfies FCC regulations, this one should get you off **that** hook, anyhow.

DIRECTORY REMINDER

In our March **CSD** we announced that we are scheduling a special, very comprehensive Industry Directory; a complete listing of all products available to the industry, as well as a listing of distributors and dealers in the field. There will be no charge for Directory listing.

Within a few weeks of the announcement, Beth Geiger had counted more than 75 requests for Directory Questionnaire forms. That's pretty decent, but I know that there are more firms than that participating in this field!

If you **manufacture** any type of hardware for private/home/low-cost TVRO systems, if you **distribute** any such hardware, if you **deal** in any such hardware; if you **deal** in a service for such operations, you are entitled to be listed in the Directory. But, to get into the Directory, you need to write or call for the Directory Questionnaire forms. The forms will need to be returned to **CSD** by the first of June. Then we'll make up your Directory listing(s) and send you back a checking copy so that you can make corrections, additions, or whatever, to the listing. You will get this back, from us, along about the first week of July.

If you have been too busy to request your forms, you need to do so; today! A full listing of Directory 'sections' or 'categories' appeared on page 52 of the March 1982 **CSD**. If you don't have a copy handy, call or write to Beth Geiger at CSD, P.O. Box 100858, Fort Lauderdale, FL 33310. Tell Beth what type of business you are in, whether you manufacture or distribute or deal, and she'll get you the proper forms.

With all of the new firms, products and services now available, we all need a comprehensive, industry-wide directory, to keep up with our own growth. Make sure your own listing is on hand so that your firm, and product (or services) will be listed!

FORT WORTH EQUIPMENT PRICING

As touched on in our Fort Worth NSOC '82 report in this issue, some of the bottoms in equipment pricing fell clear out, in Fort Worth.

CONTINUED/page 54

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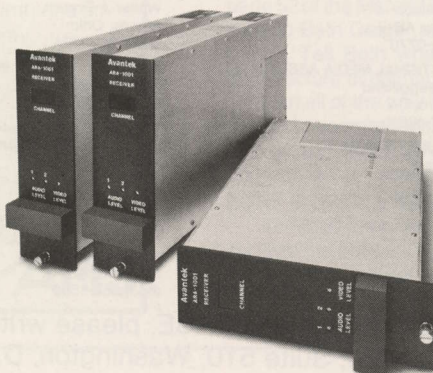
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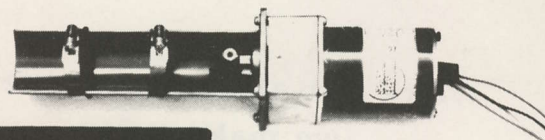
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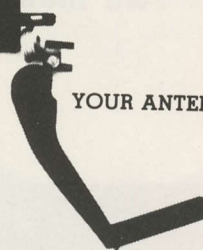
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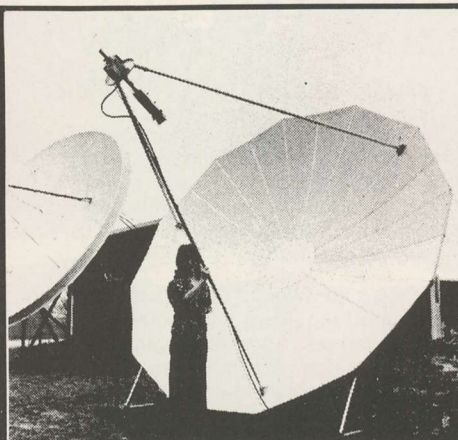
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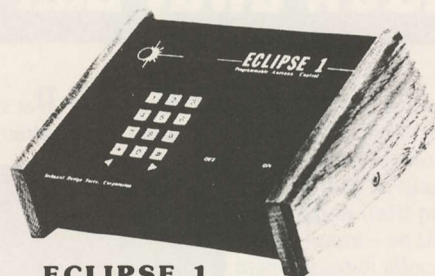


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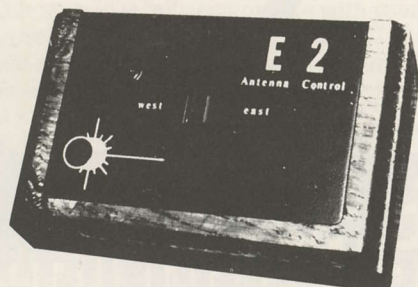


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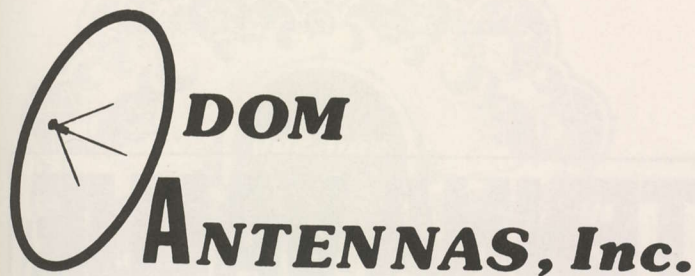
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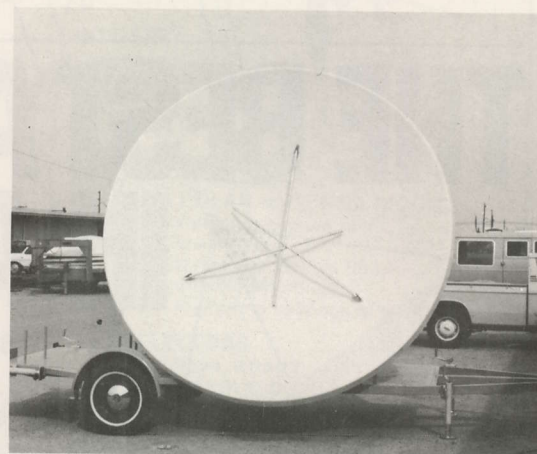
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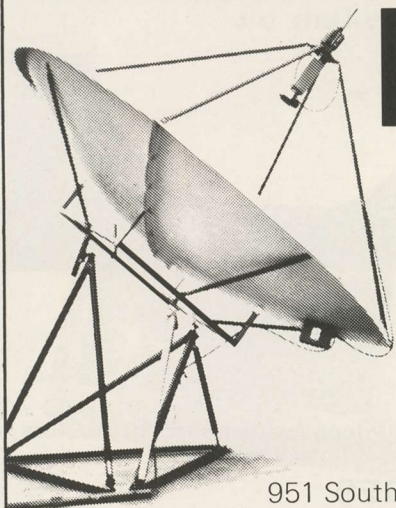
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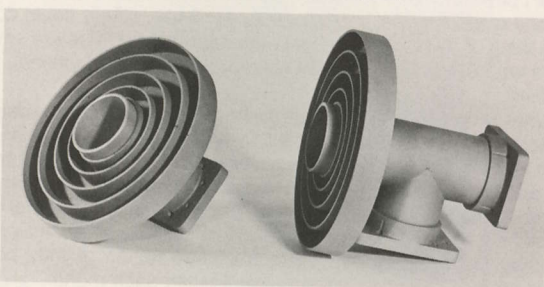
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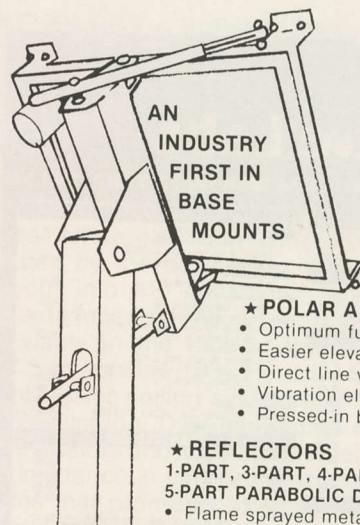
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CONTINUED/from page 46

One fellow, who buys and used perhaps 50 LNAs per month, grabbed me by the arm late Friday afternoon. "I cannot believe this; every-time I make a new circle around the floor, to the booths, I get a lower LNA price! What is happening here?"

What was happening was the law of supply and demand. LNA prices have held in the \$450 range (lowest price, largest buyers) for about six months now. Then the industry hit the winter doldrums, and between an especially severe winter, and, rapidly increasing LNA productivity, the supply built rapidly on manufacturer shelves. This prompted the manufacturers to put some extra pressure on the distributors. And the distributors found themselves shipping out half the quantity they received each week; the rest building, and building, and building. It all came to a head at the Fort Worth Show.

Bowman has been advertising 110 degree LNAs for just under \$400 for a couple of months. And that is a onesy-twosy price, not a big buy(er) price. Obviously, if Bowman can buy their LNAs (from Avante) and resell them, at a profit, for under \$400, others could do the same thing. Bowman buys a bunch per month, but, there are several others who buy more. And sell for more (in small quantities), than Bowman.

What gave, in Fort Worth, was the price margin. A few big dealers, and some not so big distributors, discovered they had been paying too much for their LNAs, for perhaps six months or more. If Bowman can buy, and then re-sell, for under \$400, that suggests that Bowman is buying in the \$300 region. As our dealers and distributors criss-crossed the floor at Fort Worth, going from booth to booth, they found that they too could be buying in the \$300 region, if they bought respectable (400 per month or so) quantities each month.

Prices, on the floor, dropped to the \$340 region for 120 degree units, before the show was over. They possibly dropped lower than that off the floor. The big concern, is, are these price drops an abnormality in the industry, caused by the seasonal factors, or, is this the new pricing wave? Most view this as a temporary thing, and then when the summer selling season gets up a full head of steam, price will be secondary to delivery. Right now there is a surplus of LNAs. By July or August, the supply may be much tighter.

The people offering LNAs, for under \$350 in Fort Worth, were doing so to protect their favored, customer status with their LNA vendors. Right now, they have too many LNAs. So they decide to sell off all of their surplus inventory for at or very close to what they paid for the units; just to allow them to hold onto their bulk buying capacity, and to be in a position to sell and get delivery on product later this year.

Fort Worth was probably a good time to stock up on LNAs, if you could afford to carry the cost of inventorying the product. How all of this shapes and reshapes this coming summer and fall will be interesting to observe.

LNA BLACKMAIL

One of the most disturbing 'stories' I heard at Fort Worth painted the big LNA manufacturers as extremely greedy, conniving chaps who were all out to put the 'little' TVRO receiver manufacturer out of business. This story made the rounds in several forms, and it got wilder and perhaps therefore more repeatable with each repetition. It boiled down to this.

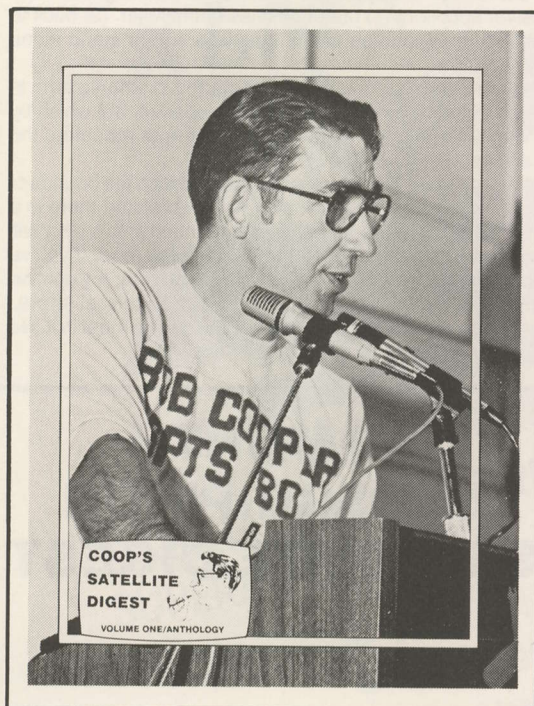
A standard LNA has 50 dB of gain. There are also 30 dB gain models out there, and when you have your down converter at the antenna proper, you can often get by with a 30 dB gain unit; which costs far less than a 50 dB unit.

The new LNC (low noise converter) packages, coming from the LNA suppliers, will marry the low noise amplifier to the down converter in a single housing. By putting everything together, you end up needing less than 20 dB of actual 4 GHz signal gain. And that translates to a two-stage LNA, typically. The end result is when a manufacturer sets out to produce a down converter and amplifier combo, he can shave big dollars off of the LNA 'portion' of the package. So far, that's good for everyone.

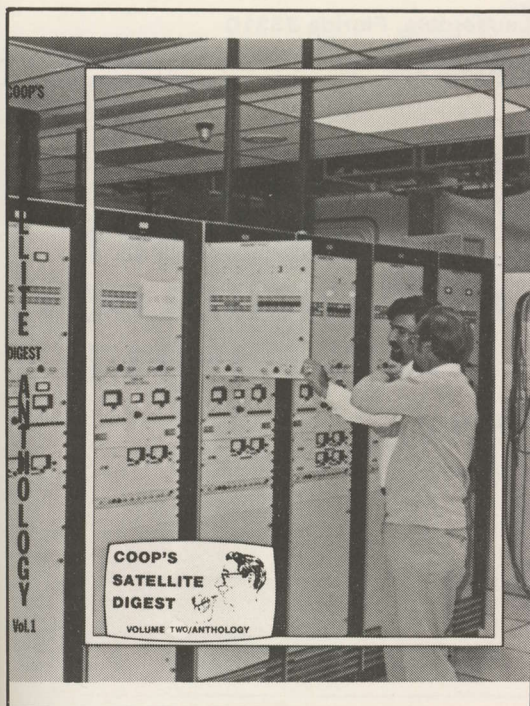
The Fort Worth story circulating painted a scenario where the LNA/LNC suppliers were going to build combo units which ONLY work with their own demodulator (i.e. indoor) units. In other words, the LNC

CONTINUED/page 56

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CONTINUED/from page 54

folks do not want you buying their outdoor units, and someone else's indoor units. That may be a little on the disagreeable side, but then it is not all that reprehensible. It just sounds like a business tactic at this point.

But the story got 'fatter.' LNAs, they said, would slowly dry up. Within a year, you will not be able to buy an LNA (defined as 4 GHz — only amplification, in a stand alone box) **unless** you are willing to pay **big bucks** (back to \$1,000 per unit we heard). The supply will dry up, the story went, and the prices will go back up. Back up to levels where the commercial CATV folks can afford the units, alright, but the backyard systems would find the prices out of line. The story explained that the rationale for this product availability change would be that with LNCs taking over the home TVRO marketplace, there was little market, and little production time available, for the larger LNA stand alone units.

And fatter again. To complicate interfacing the LNC to the indoor demodulator, special cables, connectors, tuning voltages and inter-

facing 'logic signals' would be built into the LNCs; **on purpose**, to make it more difficult (never say impossible to a satellite person!) to interface a Gillaspie, for example, with an M/A COM LNC.

All of this subterfuge is **supposed** to drive the non-aligned, independent receiver suppliers (1) out of business, totally, or, (2) back to the high end, big dollar portion of the business where stand alone LNAs will still sell.

Let me restate that this is the 'story' that started in embryo form in Fort Worth, perhaps the night before the show opened, but which by show's end was sweeping the floor. Each time it was repeated, the story grew, and grew . . . and grew.

Now I like a good story. But this one seems to stretch the bounds of reality. I'm sure that someplace in what was being related there is a modicum of truth. I seriously doubt that a major portion of this story will hold water, or prove accurate a few months down the road. If you've heard the story, and are worried what may be happening, my opinion is that you should not worry. The story is filled with 'technical errors.' On the other hand, if the story does prove to have **some** meat in it, we are all now properly warned of what to look out for!

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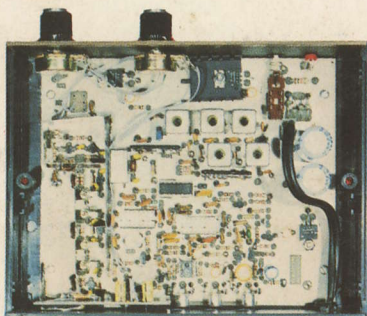
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